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Department of Movement and Sports Sciences

Attending to the dark side of teachers' motivating style: Controlling teaching in relation to student motivation in physical education

Jotie De Meyer

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Supervisor:

Prof. dr. Leen Haerens

Co-supervisor:

Prof. dr. Bart Soenens

Supervisory board:

Prof. dr. Leen Haerens

Prof. dr. Bart Soenens

Prof. dr. Maarten Vansteenkiste

Prof. dr. Hilde Van Keer

Examination board:

Prof. dr. Kristiane Van Lierde

Prof. dr. Greet Cardon

Prof. dr. Karine Verschueren

Prof. dr. Jan Seghers

Prof. dr. Benedicte Deforche

Prof. dr. Martin Valcke

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CHAPTER 1

GENERAL INTRODUCTION

Grounded in the Self-Determination Theory (SDT; Deci & Ryan, 2000), the present dissertation is centered around the (de-)motivational effects of teachers' controlling style within the context of secondary school physical education (PE). In the first part of the introduction we describe the general context of PE situated within an educational framework. This description serves to illustrate why it is relevant to study a controlling style in secondary school PE. In the next part, we outline SDT's main concepts, starting with a description of the essential role of students' basic psychological needs, followed by an overview of studies on how teachers can either support or thwart these needs through their motivating style, and its consequences for students' motivation. In the final section of the introduction we will highlight gaps and shortcomings in the literature and discuss how these gaps are addressed by the main objectives of the present dissertation.

1 Physical education situated within an educational framework

In Flanders any child between the age of 6 to 18 years has to follow compulsory education. Although compulsory education does not mean compulsory school attendance, most of the children are going to school. Physical education (PE) belongs to the core curriculum and is therefore mandatory. It is generally organized in sequences of the same activities (e.g., 3 – 6 weeks of dance, 3 – 6 weeks of gymnastics) that are taught to students in two separate lessons of 50 minutes or in a single 100-minute lesson each week. Only qualified teachers holding a Bachelor or Master Degree in the domain of PE are allowed to teach in secondary school.

From an educational perspective different aggregation levels (i.e., macro-, meso-, and micro-level) can be distinguished which have their implications for students' learning. In what follows we will discuss the educational framework (Valcke, 2010) which is presented in

Figure 1. Each of these three levels has its own actors and processes, with their characteristics. Society, politics, and educational organizations are situated at the macro-level. Processes that take place at this level affect students across schools, for instance a decision by the government to lockdown all schools in Brussels because of a terror threat. The meso-level is defined as all factors that are related to the school or school-units. A school can for instance decide that students have to wear a uniform during PE classes. The actual interactions between teachers and students, which is the focus of the current dissertation, are situated at the micro-level. The following dimensions are distinguished at the micro-level: actors (i.e., teachers and students) with their characteristics (e.g., age, gender, beliefs, socio-economic status…), organization, teachers' didactical approach, and students' learning activities. The dimension didactical approach consists of five components, that is, objectives, lesson content, instruction, media, and assessment. Organization is a separate dimension because the teacher has merely no impact on this factor, it contains for example number of students, size of the gym, time schedule, distance to the gym, budget,… Importantly, with the dimension organization we do not mean the organization of the lesson by the teachers, which is part of the didactical approach. Students' learning activities are students' actual learning behavior and may be considered as a result of teachers' didactical approach. In what follows we will discuss the five different components of the didactical approach in detail.

1.1 Objectives

Much like in other countries, at the macro-level, the final attainment goals are prescribed by the government. There are three major goals: (a) improving students' motor competence, (b) strengthening their self-concept and social functioning, and (c) promoting a physically active and healthy lifestyle that persists into adulthood (Ministry of the Flemish

Community, 2014). Within the boundaries set by the government, educational authorities (e.g., VSKO, GO!, VBSG) have the freedom to interpret and tune the attainment goals to their own ideological and philosophical vision and make up their own learning plan which is approved by the government.

At the meso-level school networks and individual schools will follow the respective learning plan depending to which educational authority they belong. They are required to make up a year plan which outlines how they will reach the objectives (De Knop, Theeboom, Huts, De Martelaer, & Cloes, 2005). In turn, at the micro-level teachers are required to teach in line with the developed year plan to make sure students will actually attain the final attainment goals, set by the government. To do so, teachers set specific observable goals for each lesson such that the learning activities of the students can be evaluated.

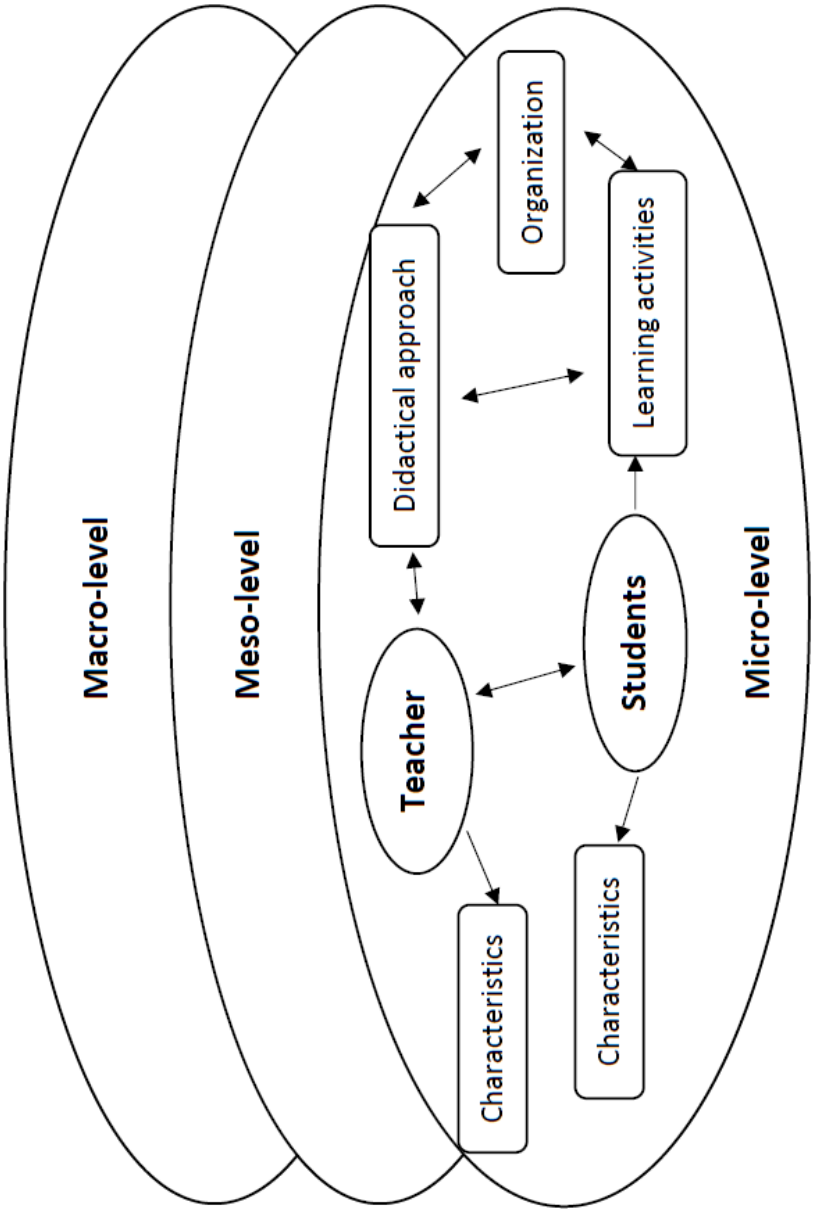

Figure 1: Educational framework with macro-, meso-, and micro-level adopted from Valcke, 2010.

1.2 Lesson content

Based on the learning objectives, the subject matter will be selected. This requires an accurate selection of information to support students' learning process. While the final attainment goals are prescriptive, lesson content is only pre-defined by the government (macro-level) for 7th – 8th graders. In the lower (1st – 6th grade) and higher grades (9th – 12th grade), schools and teachers (meso- and micro-level) have the freedom to choose within certain boundaries (i.e., within the context of the learning plan) which (sports) activities they want to teach situated within prescribed 'movement domains'.

Since the early 1900s, the subject has changed from a predominantly gymnastic-based content – with a predominant focus on Swedish gymnastics and German Turnen (Renson, 1998), characterized by drills, rigid forms of systematic exercises, discipline, and obedience – towards a more sports-oriented content (e.g., team games) in the mid-nineteenth century. More recently the content focus has shifted from motor skills and physical fitness towards the development of a positive attitude towards physical activity (De Knop et al., 2005). As students' attitude becomes more central in PE, the way teachers interact with their students also becomes more important. In the next section we will discuss how contemporary PE teachers typically teach their students.

1.3 Instruction

Apart from the lesson objectives and the subject matter, teachers can differ in the way they present the content. In the literature a distinction is made between 'activity-based' and 'model-based' instructional models. An activity-based structure prompts a focus on performance in the activities per se, and does not encourage a focus upon transfer to learning in other contexts (e.g., learning beyond school) (Penney & Chandler, 2000). Disciplines, learning activities or content are, in other words, the organizing center for

physical education teaching (Haerens, Kirk, Cardon, & De Bourdeaudhuij, 2011). Whereas activity-based instructions are still predominant among PE teachers (Metzler, 2005), there is a growing interest in 'model-based' instructional models (e.g., Dyson, Griffin, & Hastie, 2014; Penney & Chandler, 2000) or 'pedagogical models' (Haerens et al., 2011). Sport Education (SE) (Siedentop, 1994) and Tactical Games (TG) (Griffin, Mitchell, & Oslin, 1997) are only two of the established models in physical education. In these models the teacher serves as a facilitator of the learning within a student-centered environment as opposed to a teacher-centered approach. The teacher purposefully shifts responsibility to the students and provides them learning activities in an authentic and meaningful framework (Dyson et al., 2014).

1.4 Media

Media refers materials and aids used by the teachers to present the lesson content (e.g., books, laptops, beamers, internet, video camera,….). Media as such have only a minor impact on students learning activities (Valcke, 2010). Specifically in the context of PE, picture cue cards are sometimes used to provide instructions or to let students evaluate each other. Other media probably play only a minor role because of the specific nature of PE. As students are generally not sitting down during PE for a long time it is hard to implement different forms of media.

1.5 Assessment

Assessment is a broad concept, which refers to different dimensions. In this section we will only shortly discuss the difference between Assessment *for* Learning and Assessment *of* Learning. Assessment *of* Learning is not formative but rather summative and the information from an assessment is used solely to make a judgment about level of

competence or achievement (Stiggins, 2009). Assessment *of* Learning takes usually place at the end of the lesson or a period and is usually related to grades or symbols.

Assessment *for* Learning takes place when assessment is used primarily for 'the process of seeking and interpreting evidence for use by learners and their teachers to decide in which stage of the learning process the learners are, where they need to go and how best to get there' (Broadfoot et al., 2002). Assessing students should then not necessarily be a negative experience as it includes 'activities to guide the learner towards the intended goals and that take place during the learning process rather than at the end of the learning process' (assessment with a formative instead of a summative function; Wiliam, Lee, Harrison, & Black, 2004). In the educational literature, Assessment *for* Learning is considered to be a powerful tool for teachers to enhance students' learning in a positive way (Black & Wiliam, 2009) and was also found to be positively related to students' optimal motivation (Maes et al., submitted).

2 Self-Determination Theory perspective on physical education

2.1 Need satisfaction and need frustration

At the heart of SDT (Ryan & Deci, 2000b; Vansteenkiste, Niemiec, & Soenens, 2010) lies the formulation of the psychological needs for autonomy, competence and relatedness. SDT, as a macro-theory on human motivation, suggests that these three psychological needs are essential, innate, and universal nutriments for psychological growth and human flourishing (Vansteenkiste et al., 2010). Just as plants require sun, soil, and water to grow, humans require satisfaction of the needs for autonomy, competence, and relatedness to function optimally at physical, psychological, and social levels (Ryan, 1995).

The need for autonomy refers to experiencing a sense of volition and psychological freedom when engaging in an activity (DeCharms, 1968; Ryan & Deci, 2006). Students high

on autonomy need satisfaction will feel that they can be themselves during the lessons and feel free to act in accordance with their own interests. Competence need satisfaction refers to feelings of effectiveness and confidence when trying to master a task or an exercise (White, 1959). For instance, when students are able to handle a specific situation, students are likely to feel competent. Finally, the satisfaction of the need for relatedness refers to reciprocal care and involves the experience of closeness, trust, or friendship in relationships with significant others such as teachers or peers (Baumeister & Leary, 1995). Students might feel fulfilled in their need for relatedness when they feel that the teacher and their fellow students really care about them. Next to satisfaction, the three basic needs can also be frustrated. Need frustration is experienced when basic psychological needs are actively thwarted within social contexts. When the psychological needs are frustrated, it would manifest in feelings of pressure (autonomy need frustration), inferiority and failure (competence need frustration), and loneliness and isolation (relatedness need frustration) (Vansteenkiste & Ryan, 2013).

The majority of the studies relying on SDT focus on the role of need satisfaction (rather than on the role of need frustration). In the context of PE it has been found that satisfaction of students' basic needs was related to optimal motivation (Ntoumanis, 2001; Standage, Duda, & Ntoumanis, 2003, 2005) and other adaptive outcomes, such as increased levels of physical activity (Cox, Smith, & Williams, 2008) and well-being (Ntoumanis, 2005; Standage et al., 2005). These basic needs are not only crucial for understanding general psychological health and well-being, but also for understanding and explaining the effects of a motivating style on relevant student outcomes such as engagement (Cheon & Jang, 2012; Jang, Kim, & Reeve, 2012) and learning (Mouratidis, Vansteenkiste, Michou, & Lens, 2012).

For quite a long time it has been assumed either tacitly or more explicitly that need satisfaction and need frustration represent opposite ends of a continuum. The distinction between need satisfaction and need frustration is crucial because low levels of need satisfaction cannot be equated with need frustration (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Vansteenkiste & Ryan, 2013). To continue the plant metaphor, if plants do not get sunshine and water (i.e., low need satisfaction), they will fail to grow and will die over time; yet, if salted water is thrown on plants (i.e., presence of need frustration), they will wither more quickly (Vansteenkiste & Ryan, 2013). Thus, whereas low need satisfaction likely yields costs over time, the process will be accelerated when needs are actively frustrated.

Recently, there is growing interest in the process of need frustration and its unique antecedents and outcomes. Empirical research in the context of sport illustrates that, after controlling for need satisfaction, which predicted well-being outcomes, need frustration was found to relate uniquely to ill-being among athletes (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011) and sport coaches (Stebbings, Taylor, Spray, & Ntoumanis, 2012). Haerens, Aelterman, Vansteenkiste, Soenens, and Van Petegem (2015) expanded this finding to the PE context and showed that need satisfaction and need frustration constitute different constructs relating quite distinctively to motivational outcomes. In the next section we will discuss how teachers can either support or thwart students' psychological needs.

2.2 Conceptualization of a need supportive and need thwarting motivating style

Parallel to the distinction between need satisfaction and need frustration, SDT distinguishes between social environments (e.g., teachers) that either support or thwart students' psychological needs (Vansteenkiste & Ryan, 2013). That is, teachers can respect

and value students' psychological needs for autonomy, competence, and relatedness by actively supporting these needs or they can neglect and undermine these needs by actively thwarting the same needs. Just like need satisfaction and need frustration, a need-supportive and a need thwarting style were assumed to represent opposite ends of a continuum for a long time. For instance, the absence of controlling language has been mentioned conceptually as a feature of an autonomy-supportive style (e.g., Deci, Eghari, Patrick, & Leone, 1994). Recent theorizing within SDT, however, suggests that, just as it seems crucial to study need frustration in its own right, it may be equally important to study a need thwarting style in its own right. Researchers argued (e.g., Vansteenkiste & Ryan, 2013) that the presence of need thwarting cannot be equated with an absence of need support and vice versa. Even when teachers do not actively support students' psychological needs (e.g., by encouraging and providing positive feedback), they do not necessarily engage in need thwarting strategies (e.g., giving destructive criticism and providing negative feedback). Instead, they may also provide no or relatively neutral feedback. Moreover, each of these strategies may have unique relationships with students' adaptive and maladaptive outcomes, and need satisfaction and need frustration might play rather specific roles in these distinct processes. In SDT, parallel to the distinction between the three needs, three dimensions of need support and need thwarting are generally distinguished. This model of motivating strategies is displayed graphically in Table 1.

Table 1. Need supportive and need thwarting strategies.

	Need supportive strategies	**Need thwarting strategies**
Relatedness	*Using students' first name*	*Ignoring students' distress*
Competence	*Providing positive feedback*	*Using destructive criticism*
Autonomy	*Being interested by asking questions*	*Commanding students*

Teachers can foster students' feelings of competence by providing a clearly structured learning environment. Structure refers to clear communication of instructions and expectations to help students in successfully achieving their goals (Skinner & Belmont, 1993). Offering students adequate help and providing positive and constructive feedback during the learning process helps students to feel competent in what they do (Koka & Hein, 2005). In contrast, teachers can also create a chaotic environment in which students will likely feel incompetent because they are in doubt and feel insecure about how to meet the expectations or achieve the required goals. These feelings of incompetence and doubt are often the result of the confusing and contradictory information and feedback students receive. A chaotic teacher creates confusion among students by giving unclear instructions, by creating an illogical and incoherent structure, and by providing ambiguous or even critical feedback (Reeve & Jang, 2006). Such an environment with little or no rules for adequate behavior elicits a permissive atmosphere, where students might rig the situation in their own favor.

Relatedness support refers to spending a considerable amount of time, energy, and resources in students. In addition to this quantitative aspect of interpersonal involvement, relatedness support also reflects the extent to which teachers interact with their students in a warm and friendly fashion (Cox & Williams, 2008; Haerens et al., 2013), which reflects a more qualitative aspect of relatedness support. For instance, teachers can support students' need for relatedness by showing that they really care about students and by listening carefully to them to figure out what is on their mind. In contrast, uninvolved teachers interact with their students in an unfriendly and cold way and might even ignore students (Skinner & Belmont, 1993).

Autonomy support involves an motivating style where teachers attempt to identify, nurture, and develop students' inner motivational resources (Reeve, 2009). To identify students' motivational resources, teachers can take their students' perspective, by showing sincere interest, and by allowing and acknowledging negative feelings such as anxiety or anger (Deci et al., 1994). Further, to nurture students' existing motivational resources or to develop new motivational resources, teachers can provide relevant choices (Patall, Cooper, & Wynn, 2010; Prusak, Treasure, Darst, & Pangrazi, 2004), encourage initiative taking (Reeve & Jang, 2006), and provide a meaningful rationale to explain the personal relevance of rules, requests and activities (Jang, 2008). In contrast, controlling teachers ignore students' perspective and largely adhere to their own agenda by applying tactics that pressure students (e.g., incentives, threats, and punishments) to make them think, feel, and act in particular ways (Deci et al., 1994; Reeve, 2009).

Theoretically, a distinction can be made between at least two types of controlling styles, namely an internally and an externally controlling style (Ryan, 1982; Soenens & Vansteenkiste, 2010). Internally controlling strategies are intended to get students to pressure themselves by appealing to their feelings of guilt, shame, anxiety, or self-worth. Externally controlling strategies are aimed at coercing and controlling students with external contingencies, such as directives, deadlines, incentives, and (threats of) punishments. Whereas externally controlling strategies are often relatively visible and overt (e.g., rewarding, yelling, using controlling language, like you 'should' or you 'must'), this will not necessarily be the case for internally controlling strategies (Soenens & Vansteenkiste, 2010). To illustrate, when a PE teacher gives students bad grades because they are misbehaving (i.e., an externally controlling strategy), the contingency between students' behavior and the punishment is obvious. However, a teacher can also punish students' misbehavior in a more

covert and subtle way, for instance, through the facial display of disappointment or through the withdrawal of attention. Still, internally controlling strategies can also be displayed in an open and overt way, for instance when the teacher verbally expresses his/her disappointment with the behavior of the students.

In the present dissertation we will mainly focus on an autonomy-supportive and a controlling style. The need for autonomy is perhaps the need most specific to SDT and the need provoking the most controversy and debate in the literature (Vansteenkiste & Ryan, 2013). In addition, practitioners in the field also have expressed the most interest in autonomy-supportive strategies, relative to the strategies to enhance competence and involvement (Aelterman et al., 2013). Compared to an autonomy-supportive style, a controlling style, which is most central to the present dissertation, received much less attention. As such, there is a need for systematic research on controlling strategies in its own right.

In the following section we will provide an overview of empirical studies on the effects of an autonomy-supportive and a controlling style. Theoretically, an autonomy-supportive style would elicit need satisfaction and, consequently, optimal outcomes, such as deep-level learning, higher performance, better social functioning and increased well-being. In contrast, a controlling style would elicit maladaptive outcomes (e.g., higher levels of drop-out, negative affect, higher levels of non-compliance) through the process of need frustration.

2.3 Effects of an autonomy-supportive and controlling motivating style

A substantial amount of research in the general educational context has shown that an autonomy-supportive style is related positively to interest and enjoyment (e.g., Black & Deci, 2000; Ntoumanis & Standage, 2009; Soenens & Vansteenkiste, 2005) and many

desirable educational outcomes including engagement (Assor, Kaplan, & Roth, 2002), deep level learning (Grolnick & Ryan, 1987), school performance (Soenens & Vansteenkiste, 2005), and persistence (Vansteenkiste, Simons, Soenens, & Lens, 2004).

In contrast to the substantial amount of research on an autonomy-supportive style, the literature on a controlling style is far less extensive. Part of this imbalance stems from the conceptualization of the autonomy-supportive and controlling style as opposite ends of the same continuum, with the autonomy-supportive style representing the positive pole and the controlling style representing the negative pole (e.g., Cheon & Reeve, 2015; Deci, Schwartz, Sheinman, & Ryan, 1981; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Reeve & Jang, 2006).

Since the last decade an increasing number of empirical studies in several domains did address the detrimental role of a controlling style as such by using a separate measurement for a controlling style, instead of using a bipolar scale. In a study with athletes, Bartholomew, Ntoumanis, Ryan, Bosch, and Thogersen-Ntoumani (2011) demonstrated that when coaches use a controlling style athletes reported higher levels of burnout, depression and negative affect, whereas an autonomy-supportive style predicted higher levels of vitality and positive affect. Also studies in the general educational context have shown that a controlling style negatively relates to optimal motivation (Amoura et al., 2015), effort and persistence (Assor, Kaplan, Kanat-Maymon, & Roth, 2005), as well as academic performance (Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012). Apart from hampering learning and performance, a controlling style will evoke maladaptive outcomes such as poor quality motivation (Soenens et al., 2012), and anger and anxiety (Assor et al., 2005) in general education, and oppositional defiance (Haerens et al., 2015) in physical education. Moreover, a controlling style can also lead to increased engagement in bullying behavior (Hein, Koka, &

Hagger, 2015), and higher levels of school dropout (Vansteenkiste & Ryan, 2013). Only a small number of these studies was conducted in the context of physical education (e.g., Haerens et al., 2015; Hein et al., 2015). Also, it was unclear whether associations were driven by internally or externally controlling strategies and only few studies addressed the specific role of need frustration in the identified relationships.

The distinct contribution of an internally and externally controlling style has been investigated more intensively within the parenting domain. Specifically, internally controlling parenting (such as love withdrawal) has been found to relate to internalizing problems in children such as depression and anxiety (e.g., Barber, 1996). An externally controlling parenting style (such as corporal punishment) were found to be more predictive to externalizing problems in children such as aggression and delinquency (e.g., Gershoff, Lansford, Sexton, Davis-Kean, & Sameroff, 2012). To the best of our knowledge, however, only a few studies investigated the specific role of an internally and externally controlling style in relation to relevant student outcomes in an educational setting. Assor et al. (2005) showed that students' perceptions of externally controlling strategies, such as not letting students work at their preferred pace, were associated with negative emotions, suboptimal forms of motivation and low school engagement among elementary school children. In a series of experimental studies, Vansteenkiste, Simons, Lens, Soenens, and Matos (2005) showed that even subtle, implicit, and covert forms of pressure (i.e., internally controlling strategies) have a negative causal impact on early adolescents' task involvement and achievement. Similarly, Soenens et al. (2012) showed that perceptions of an internally controlling style were related to poorer quality of motivation to study, which, in turn, related to less use of learning strategies and lower grades. In one of the few studies directly comparing internally and externally controlling strategies, Wijnia, Loyens, Derous, and

Schmidt (2014) found evidence in two samples of first-year university students that both types of controlling strategies undermined students' motivation and performance in problem-based learning to the same degree. In the context of PE, Hein et al. (2015) demonstrated that only an internally controlling style (and not an externally controlling style) were positively related to student self-reports of anger and bullying. Associations of an internally controlling style with these student outcomes were mediated by students' need frustration.

Thus, up until today, few studies have investigated how a controlling motivating style in itself relates to important student outcomes. Moreover, few studies addressed the differential effects of an internally and externally controlling style simultaneously. Hence, their differential associations with student motivation remain to be examined, particularly in the context of secondary school PE.

2.4 Observing controlling strategies

SDT claims that especially strategies that are *perceived* by students as controlling will predict maladaptive motivational outcomes (Black & Deci, 2000; Jang, Reeve, Ryan, & Kim, 2009). Therefore, it is not surprising that the few studies on a controlling style typically relied on student self-reports. Yet, to gain deeper insight in what controlling strategies exactly look like and to strengthen this line of research at the methodological level observational measurements are needed (Reeve et al., 2014). An overview of the observational and self-report measurements of controlling strategies, is provided in Appendix. As suggested by Haerens, Vansteenkiste, Aelterman, and Van den Berghe (in preperation) the use of observational measurements in addition to self-reports yields several advantages. First, observational ratings of motivating strategies provide a richer understanding of the specific manifestations of a controlling style in PE. To illustrate, teachers might use different

controlling strategies during specific parts of the lesson (e.g., communicating deadlines primarily in the beginning of the lesson) or teachers might pressure only some students at specific occasions throughout the lessons (e.g., “Sean, tell me why are you talking. You were not listening!”). When compared to most available student reports, which provided a more generic assessment of teachers’ overall controlling style, observational ratings provide better insight in these concrete controlling strategies and the specific reactions of students to this style. Second, solely relying on self-reports may cause problems of shared method variance, which means that associations between two measurements of the same participants get artificially inflated due to response tendencies. Using observational ratings can overcome this methodological limitation. Third, by simultaneously relying on both student reports and observational ratings of controlling strategies, researchers can investigate the hypothesized intervening role of students’ perceptions in associations between actual motivating strategies and outcomes.

In spite of the many advantages of external observations, most studies investigating teachers’ controlling style were based on student reports. Yet, there are some studies that have included external observations of controlling strategies. Some of these studies relied on bipolar items ranging from highly autonomy-supportive to highly controlling (e.g., Cheon, Reeve, & Moon, 2012; Reeve et al., 2004). Other studies measured controlling strategies as such (e.g., Van den Berghe et al., 2013). In the present dissertation we will mainly focus on those studies that included separate observations of controlling strategies because we are interested in the unique effects of teachers’ controlling style on student outcomes.

A number of observation studies were conducted in laboratory situations where pairs of individuals either were assigned to the role of a student or to the role of a teacher (Deci, Spiegel, Ryan, Koestner, & Kauffman, 1982; Reeve & Jang, 2006). In these studies, external

raters observed a list of controlling strategies (e.g., 'criticizing students', 'uttering directives and commands'). Reeve and Jang (2006) showed that these observed controlling strategies, elicited by a pressuring context, had detrimental effects on the students, such as lower levels of autonomy satisfaction. Although informative, these laboratory studies are limited in terms of generalizability and ecological validity. The teaching situation was limited to teacher-student pairs who were formed just before the experiment and interactions lasted only for a short period. A real-life PE lesson is more complex because teacher-students interactions are embedded in earlier experiences during previous lessons. For instance, in most situations teachers teach a group of students for lessons of approximately 50 minutes. Moreover, it is possible that some of the controlling strategies that were identified and studied in the laboratory (Deci et al., 1982; Reeve & Jang, 2006) are only rarely observed in real classes. Flink, Boggiano, and Barrett (1990) conducted an experimental study on teachers' controlling strategies in a real life setting, with a sample of 13 teachers teaching several small groups of students (each teacher taught 2 to 5 groups of 4 to 7 students) for periods of 10 minutes each. Consistent with SDT, students' performance was impaired when they were taught by teachers who were pressured to maximize students' performance level and when teachers used controlling strategies. Although the study by Flink et al. (1990) was conducted in an ecologically valid setting, the natural class context was disturbed by breaking down the class group in smaller groups, and the activities performed by the students (e.g., anagrams) were not really representative for real-life school activities.

The introduction so far revealed that teachers' controlling style has been investigated less frequently, at least when compared to an autonomy-supportive style. Giving the dearth of studies on a controlling style, a **first aim** of the present dissertation was to obtain a better understanding of how teachers actually pressure students during their lesson. In an attempt

to build on the small body of research using observational ratings of a controlling style (Cheon et al., 2012; Deci et al., 1982; Flink et al., 1990; Reeve et al., 2004; Reeve & Jang, 2006), we observed teachers' engagement in controlling strategies during regular PE lessons while simultaneously assessing students' perceptions of teachers' engagement in controlling strategies through student reports.

Furthermore, little attention has been paid to the distinct contribution of teachers' internally and externally controlling strategies. Those studies that made a distinction between both forms of teachers' controlling style focused either on internally controlling strategies (Vansteenkiste, Simons, et al., 2005) or on externally controlling strategies (Assor et al., 2005). Up until today, only few studies investigated simultaneously internally and externally controlling strategies in relation to students' outcomes (e.g., Hein et al., 2015; Wijnia et al., 2014). A **second aim** of the present dissertation was to obtain more detailed insight in these two different manifestations of teachers' controlling style in relation to students' motivation. To investigate relationships between teachers' controlling style and students' motivation, we made a distinction between different motivational regulations as defined within SDT's motivational continuum.

2.5 Student motivation

SDT conceptualizes motivation in terms of quality on a continuum of increasing autonomy ranging from amotivation over controlled motivation to autonomous forms of motivation (Deci & Ryan, 2000). In contrast with controlled and autonomous motivation, which involve at least a certain degree of intentionality, amotivation is a state in which students lack the intention to behave, and thus lack motivation. Students display a lack of motivation to engage in the required activity because they do not value the goal served by the behavior, because they believe the behavior is not instrumental to reach the goal, or

because they lack the sense of efficacy or the sense of control to perform the activity (Deci & Ryan, 2000; see Figure 2).

Controlled motivation comes with feelings of pressure and compulsion and can take two different forms. In the case of external regulation, students act because they feel pressured by external forces, such as by the promise of good grades or the threat of punishments. Because experiences of pressure can also originate in students' own functioning, introjected regulation is considered a second type of controlled motivation. In this case, students act out of the avoidance of guilt, shame, or anxiety or in an attempt to bolster their self-worth. When students act because they want to outperform their peers, they display introjected regulation.

In contrast, autonomously motivated students have more volitional reasons to put effort into the lesson. A distinction can be made between identified regulation and intrinsic motivation (Deci & Ryan, 2000). Identified regulation occurs when students understand and endorse the value of an activity, even though they may not necessarily find the activity enjoyable as such. For instance, students might listen to the teacher's instruction because they realize that the instructions are important to perform an exercise adequately. The prototypical form of autonomous motivation is intrinsic motivation. Intrinsically motivated students engage in an activity for the sake of the enjoyment and challenge experienced in the activity itself.

Research in education in general has shown that autonomous motivation is related to adaptive outcomes such as the use of adaptive learning strategies (e.g., Vansteenkiste, Zhou, Lens, & Soenens, 2005), higher grades (e.g., Guay & Vallerand, 1997), and personal well-being (Sheldon, Ryan, Deci, & Kasser, 2004). Specifically in the context of PE, research has shown that autonomous motivation is positively related to concentration (Standage et al.,

2005), vitality (Mouratidis, Vansteenkiste, Lens, & Sideridis, 2011), objectively recorded physical activity, rated engagement (Aelterman et al., 2012) and performance (Vansteenkiste et al., 2004). In contrast, controlled motivation is either unrelated to these desirable outcomes or positively related to maladaptive student outcomes, such as maladaptive coping strategies (e.g., Vansteenkiste, Zhou, et al., 2005). Amotivation has been found to relate to multiple negative outcomes, including boredom (Ntoumanis, 2001) and lower intentions to partake in physical activity outside of PE.

2.5.1 Student motivation as an outcome of teachers' motivating style

In SDT it is argued that teachers' motivating styles affect the quality of students' motivation. Specifically, SDT predicts that autonomy-support catalyses a 'bright' pathway toward optimal motivation (i.e., autonomous motivation) because an autonomy-supportive style nurtures students' basic psychological needs for relatedness, competence, and autonomy (e.g., Filak & Sheldon, 2008; Jang et al., 2012). Parallel to this bright pathway, researchers within SDT have increasingly argued for the existence of a separate 'dark pathway' activated by controlling socialization (Ryan & Deci, 2000a; Vansteenkiste & Ryan, 2013) and experiences of need frustration (e.g., Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011). Through its association with need frustration, a controlling style would be related to maladaptive motivational outcomes such as controlled motivation and amotivation. Support for the existence of a specific dark pathway was obtained in the domains of sports (e.g., Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011; Stebbings et al., 2012), work (e.g., Gillet, Fouquereau, Forest, Brunault, & Colombat, 2012), Fouquereau, Forst, Brunault, & Colombat, 2012), and health (e.g., Verstuyf, Vansteenkiste, Soenens, Boone, & Mouratidis, 2013). Only few studies demonstrated the existence of a specific dark pathway in the educational context. One exception is a study by Haerens et al. (2015), who provided

evidence for a bright path from perceived autonomy support via need satisfaction to autonomous motivation as well as for a dark pathway from a perceived controlling style via need frustration to controlled motivation and amotivation. The study by Haerens et al. (2015) only documented relationships between motivating strategies and the broader dimensions of motivation (i.e., autonomous and controlled motivation). For the second aim of the present dissertation we want to provide deeper insight in the relationships between types of controlling strategies and students' distinct types of controlled regulation. We were interested to see, for instance, whether an internally controlling style would be a relatively unique predictor of introjected regulation.

2.5.2 Student motivation as a moderator

Besides acting as a mediator in the relationship between motivating style and learning outcomes, students' motivation can also play a different role, that is the role of moderator. More precisely, students' motivation may alter the effects of a controlling style, an idea that is consistent with the general notion that children are pro-active agents in the socialization process rather than just passive recipients of socialization figures' behavior (Reeve, 2013; Sameroff & Fiese, 2000). One way in which the pro-active role of students' motivation can manifest is by affecting students' responsiveness to the teacher's behavior. Specifically, depending on their quantity and quality of motivation, students may differ in (a) the degree to which they derive a sense of need satisfaction and subsequently benefit from an autonomy-supportive style and (b) the degree to which they suffer from a controlling style and corresponding experiences of need frustration. Only a few studies examined whether students react differently to teachers' motivating style depending on their own motivation for a specific class. These studies yielded somewhat conflicting findings. Black and Deci (2000) found evidence for a moderating effect of student motivation, such that only students with

relatively low (but not those with high) autonomous motivation performed better if they perceived their teachers as more autonomy supportive. In contrast, Mouratidis, Vansteenkiste, Sideridis, and Lens (2011) demonstrated that autonomously motivated students benefited somewhat more from an experimentally induced need-supportive, relative to a need-thwarting, class in PE in terms of enjoyment and vitality. These discrepant findings are hard to explain, possibly due to the use of a different study design (i.e., correlational versus experimental).

Given these discrepancies and, more generally, the paucity of studies on the potentially moderating role of student motivation, a **third aim** in this dissertation was to investigate whether the positive and negative effects of an autonomy-supportive and a controlling style hold independently from students' motivation. This question is of major importance because

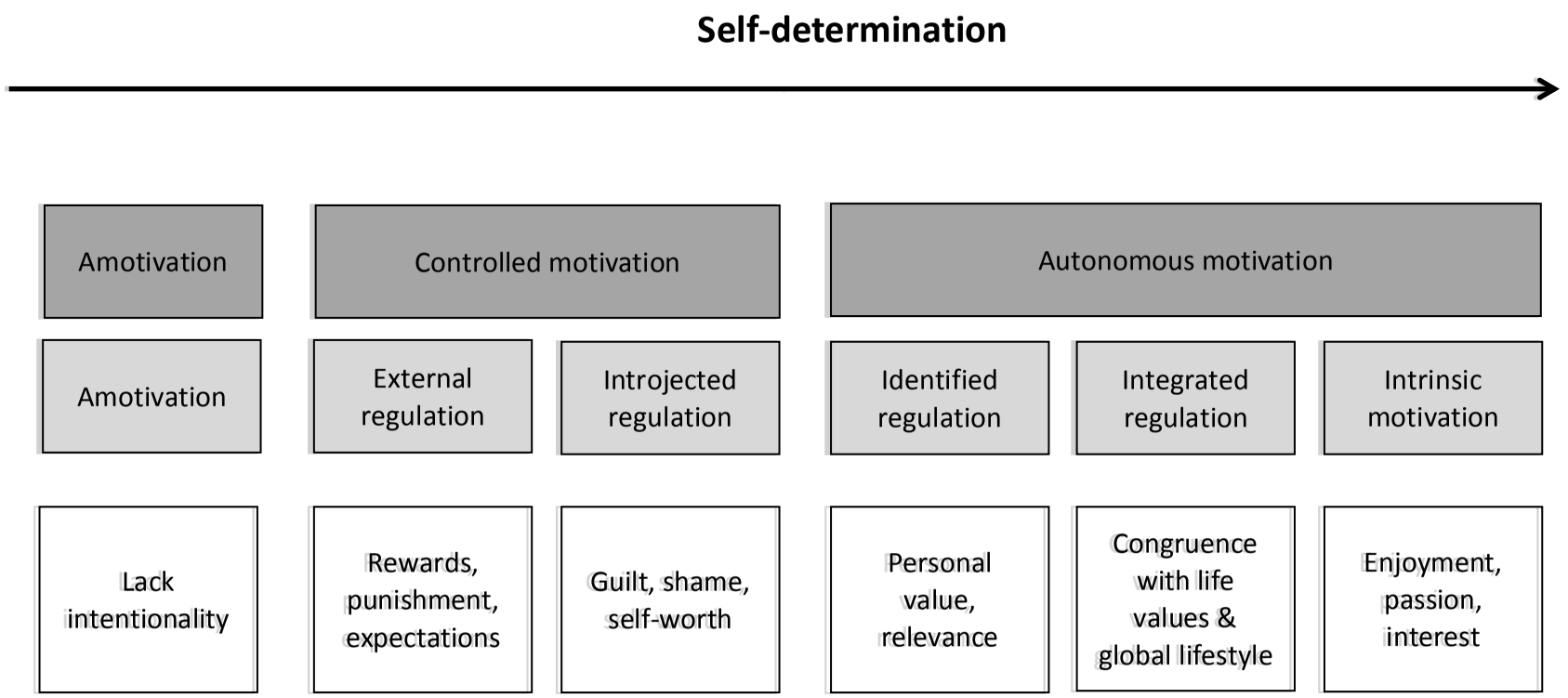

Figure 2. The motivational continuum according to Self-Determination Theory (Ryan & Deci, 2000; Vansteenkiste et al., 2010).

many teachers may believe that only students with optimal motivation benefit from autonomy-support while less optimally motivated students need to be pressured.

2.6 Student outcomes

Besides motivation, fostering students' engagement during the PE lesson is an important objective, because it functions as a behavioural pathway from motivation to learning and development (Wellborn, 1991). Student engagement is defined as the quality of students' involvement and is considered to be an outward manifestation of motivation (Connell & Wellborn, 1991; Deci & Ryan, 2000; Skinner, Marchand, Furrer, & Kindermann, 2008). It is a multifaceted concept and reflects behavioral, emotional, and cognitive involvement within an activity. It is of great importance in education because it has been found to relate to a multitude of desirable outcomes, including better learning, higher grades and less drop-out (Skinner, Kindermann, Connell, & Wellborn, 2009). Thus, engagement is important because it predicts important outcomes and because it reveals underlying motivation. In the current dissertation we will only reflect on behavioral engagement, which is based on students' active participation in academic activities and exercises, reflected by indicators such as students paying attention, putting effort into the lesson, being persistent, and verbally participating (Aelterman et al., 2012; Reeve et al., 2004; Skinner et al., 2008). Students are not always willing to put effort in an activity and can even resist to cooperate. Oppositional defiance, has been defined as a blunt rejection of authority, as reflected in a tendency to do the opposite of what is expected, and is conceived as a defensive, compensatory way of coping with a controlling environment (Skinner, Edge, Altman, & Sherwood, 2003; Vansteenkiste & Ryan, 2013). Aelterman, Vansteenkiste, Soenens, and Haerens (in revision) found that students who showed higher levels of oppositional defiance during the PE lesson reported higher levels of resentment.

3 Conclusion

In conclusion, SDT-based research on teachers' controlling style is still in its infancy. Most of the work that has been done so far was cross-sectional (Haerens et al., 2015; Soenens et al., 2012) or experimental (Flink et al., 1990; Koestner, Ryan, Bernieri, & Holt, 1984; Niemiec & Ryan, 2009; Reeve & Jang, 2006) in nature. Those studies that have been investigating teachers' controlling style relied mainly on self-reports with a number of disadvantages as a result, such as an increased likelihood of artificially inflated relationships. These studies point rather consistently to the detrimental effects of a controlling style. Hence, more research is needed to obtain a better understanding of what controlling strategies actually are, thereby making use of more sophisticated designs (i.e., observational designs). A second gap in the literature with regard to teachers' controlling style is the scarcity of studies that have investigated the distinct contribution of internally and externally controlling strategies. Most studies relied on undifferentiated measurements of a controlling style (e.g., Haerens et al., 2015) and a few studies included either measurements of internally (e.g., Soenens et al., 2012; Vansteenkiste, Simons, et al., 2005) or externally controlling strategies (e.g., Assor et al., 2005). A third gap that can be identified is the lack of knowledge about the moderating role of student motivation in the relationship between a controlling style and important student outcomes. Only few studies investigated to what extent these relationships depend on student motivation (e.g., Black & Deci, 2000; Mouratidis et al., 2011).

A **first aim** of the present dissertation was to help bridge the first gap identified in the literature by examining effects of a controlling style using both external observations and student reports. In a sample of 56 teachers and 702 students out of 56 different schools, we investigated the relationship between external observations and student perceptions of

teachers' controlling style and their relationships with students' motivation. Specifically, we investigated whether students' perceptions of a controlling style play a mediating role in the relationship between an observed controlling style and students' motivation. Finally, we examined whether an observed controlling style would relate uniquely to a perceived controlling style and maladaptive motivational outcomes or whether, on top of that, a controlling style would also relate negatively to adaptive motivational processes, that is, perceptions of an autonomy-supportive style and autonomous motivation for PE.

A **second aim** of the present dissertation was to obtain more insight in the distinct contribution of internally and externally controlling strategies in relation to students' motivation. We hypothesized that externally controlling strategies would especially predict external regulation and amotivation, whereas internally controlling strategies would be especially predictive of external regulation and introjected regulation. Perceived internally and externally controlling strategies were assessed in a sample of 925 students out of five different schools. First, using both expert ratings and factor analysis on student ratings of the perceived controlling strategies, we examined whether internally and externally controlling strategies represent distinct dimensions. Next, we explored whether internally and externally controlling strategies relate differently to students' motivation. Third, we were interested to see whether teachers can display unique combinations of internally and externally controlling strategies using cluster-analyses. If we could determine different controlling profiles, we would expect these between-profile differences to confirm the hypothesized differential associations between the two types of controlling strategies and students' motivation.

A **third aim** was to investigate the moderating role of student motivation in the relationships between a controlling style and relevant student outcomes (i.e., engagement

and oppositional defiance). First, we examined the impact of an autonomy-supportive and a controlling style on student engagement and oppositional defiance. Those outcomes were selected because they represent what many teachers strive for, that is, engaged students who do not defy teachers' authority. The main goal was to investigate the moderation effect of students' motivation in the relationship between teachers motivating style and student engagement and oppositional defiance. For this study we relied on an experimental design and we recruited 320 students out of two schools.

These three aims were investigated in three different samples of secondary school students. We focused especially on this age group because it has been demonstrated that students display lower levels of optimal motivation and lower levels of physical activity in school as they grow older (e.g., Theodorakis, Natsis, Papaioannou, & Goudas, 2003). The transition from primary school to secondary school is a particularly sensitive period characterized by high risk for these processes.

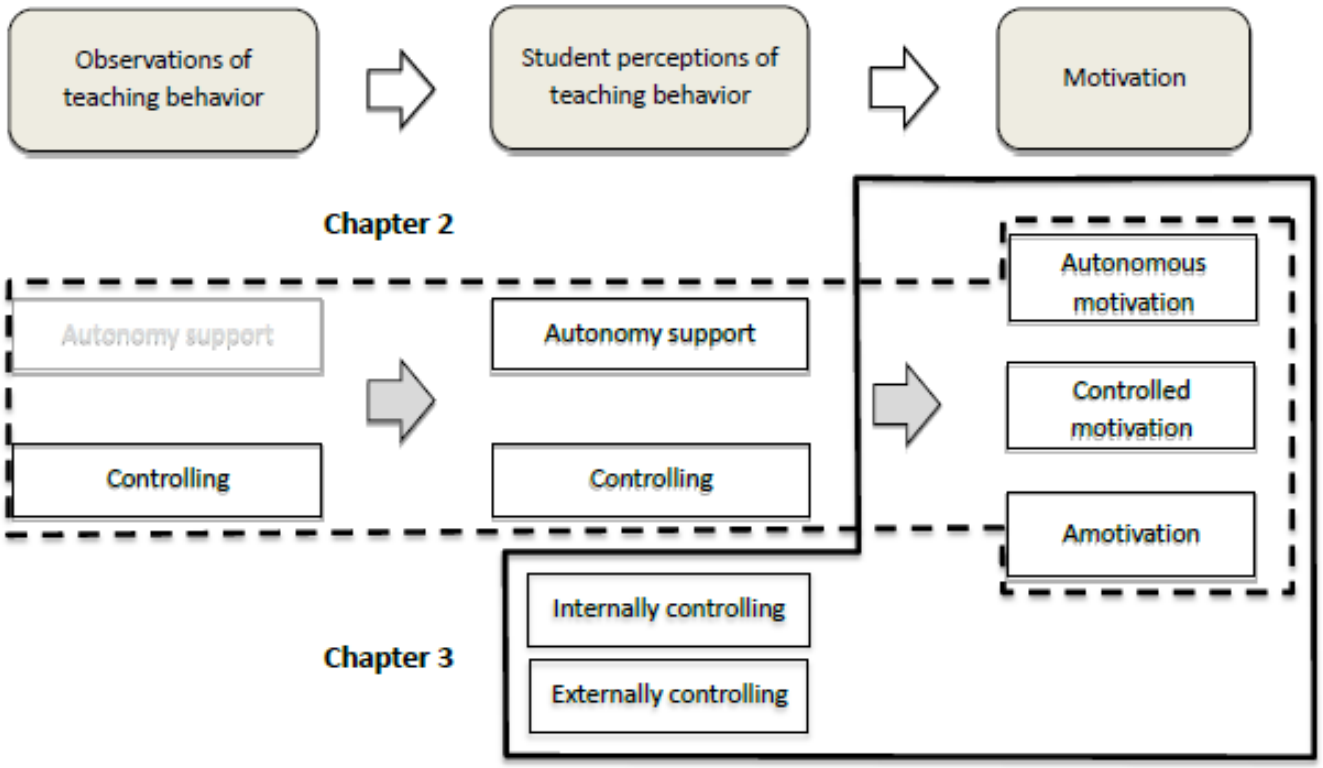

Figure 3. Schematic overview of Aim 1 and 2: Teachers' motivating style in the prediction of student motivation.

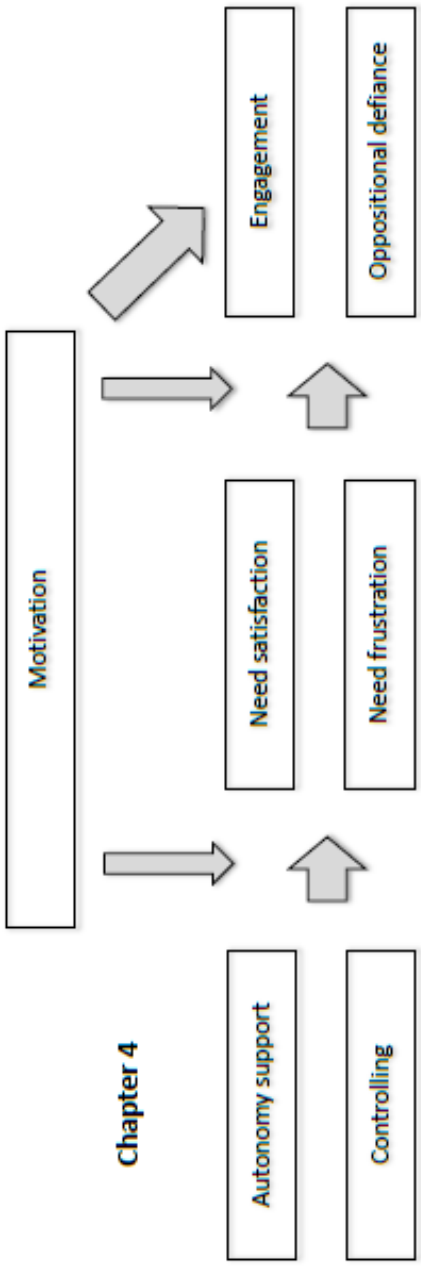

Figure 4. Schematic overview of Aim 3: Student motivation as a moderator in relationship between teachers' motivating style and student outcomes.

4 What is this dissertation about and what is it not about?

In the introduction we started by situating PE within an contemporary educational framework (Valcke, 2010). In the current dissertation we have studied teacher-student interactions from a motivational perspective, namely from Self-Determination Theory (Deci & Ryan, 2000). We suggest that every feature of a teachers' didactical approach can be implemented in a more autonomy-supportive or a more controlling way. In what follows we will give an example of a lesson basketball to illustrate that didactical approach and motivating style are two different dimensions of teaching.

When a teacher prepares a basketball lesson he sets his goals first and then decides which content he wants to provide. If the goal of the lesson would be for students to acquire the skill of the lay-up, some teachers can choose to provide skill-based decontextualized exercises, while others can choose to provide game-based situations in which the skill is practiced in context. While the teachers in the first example might be more likely to use direct instruction, a game based approach will more likely be implemented by means of guided discovery approach in the second situation. The teachers' choices will then hopefully determine his way of assessing, while the first teacher will be more likely to use a skill-based assessment (e.g., how many out of 10 lay-ups are scored), the second teachers might use a game based situation (e.g., assessing students' ability to implement the lay-up in a game based situation). While the choice for a game based situation rather than a skill based lesson might be more motivating in itself (most children like to play games; i.e., intrinsic motivation) and the usefulness of the lay-up will be more obvious for the child (i.e., identified regulation), both lessons can still be delivered in a more or less controlling way. That is each of these teachers can still criticize the students, can still yell, or can appeal to students' self-worth to name just a few examples of a controlling style. As such we consider the motivating style of

the teacher, as investigated in the present dissertation, as surrounding each of didactical dimensions (see Figure 5).

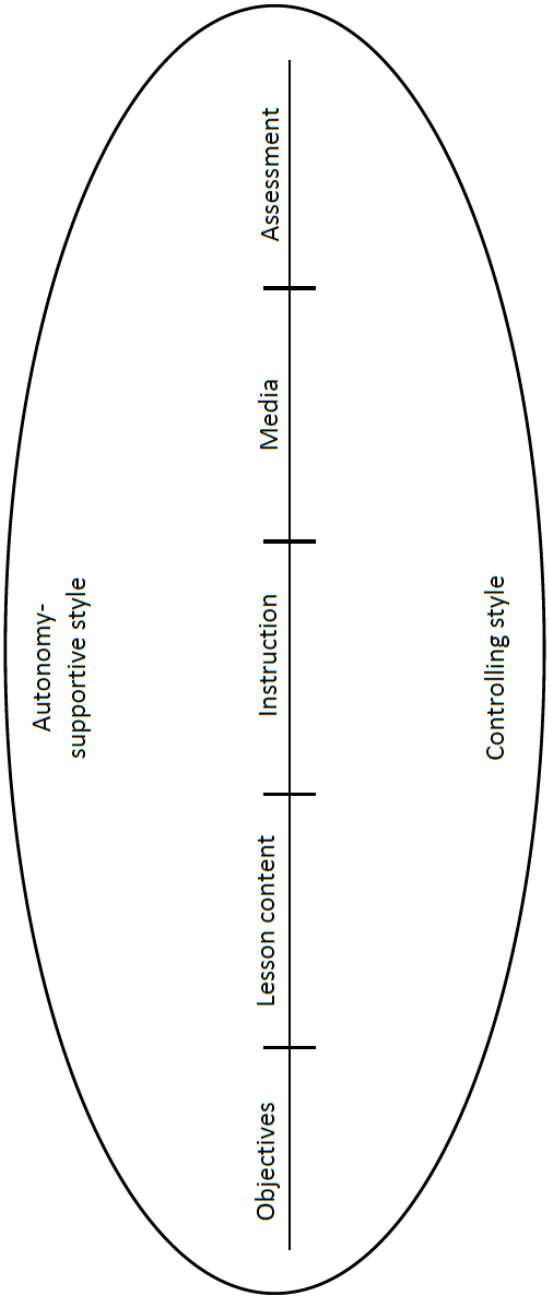

Figure 5. The interplay between teachers motivating style and the different didactical dimensions at the micro-level.

Appendix

Overview of observational and self-report measurements of teachers' controlling style

Measurement / Study	Self-report / Observations	Internally or externally controlling	Bipolar or absolute scores autonomy and control	Sample item
		External Observations		
Reeve, Jang, Carrell, Jeon, & Barch, 2004	External observations	Not differentiated	A 7-point scale ranging from controlling to autonomy (bipolar)	"Neglects to provide explanatory rationales *vs* Provide explanatory rationales"
Reeve & Jang, 2006	External observations	Not differentiated	-2 items time-bound -1 item was scored as a number of solutions that was exhibiting by the teacher themselves -6 items were rated in terms of frequency of occurrence	"Time teacher talking" "Exhibiting solutions/answers" "Praise as contingent reward"
Deci, Spiegel, Ryan, Koestener, & Kauffman, 1982	External observations	Not differentiated	-9 categories of utterances - One 'Subjective' item on a 9-point scale	" Should statements" "Teacher seemed demanding and controlling"
Reeve, Bolt, & Cai, 1999	External observations	Not differentiated	-14 objective ratings -22 subjective ratings	"Controlling questions"
Van den Berghe et al., 2013	External observations	Not differentiated	7 items on a 4-point scale	'Commands students, uses controlling language and imperatives'

Self-Reports

Directly Controlling Teacher Behavior (DCTB; Assor & Eilot 2001; Assor, Kaplan, Kanat-Maymon, & Roth, 2005)	Student report	Externally controlling	4 items on a 4-point scale	"Teacher does not let me work in my own pace" and ''Teacher is willing to listen only to opinions that fit her views''
Psychological Controlling Teaching (PCT; Soenens et al, 2012)	Student report	Predominantly internally controlling	9 items on a 5-point scale	"My teachers are strict with me when I disappointed them"
Controlling Teacher Questionnaire (CTQ; Jang Reeve, Ryan, & Kim, 2009) or (Jeon, 2004)	Student report	Not differentiated	4 items on a 7-point scale	"My teacher puts a lot of pressure on me"
Assor, Kaplan, & Roth, 2002	Student report	Not differentiated	16 items on a 4-point scale -Intruding - Suppressing criticism & independent opinions - Forcing meaningless and uninteresting activities	"The teacher tells me what to do all the time"

Self-Reports (continued)

Problems in Schools Questionnaire (Deci, Schwartz, Scheinman, & Ryan, 1981)	Teacher report	Not differentiated	8 short vignettes describing typical problems occurring in school followed by 4 possible ways to deal with this situation as a teacher. The 4 items were assessed on a 7-point scale: -Highly controlling -Moderately controlling -Moderately autonomous -Highly autonomous	Jim is an average student who has been working at grade level. During the past two weeks he has appeared listless and has not been participating during reading group. The work he does is accurate but he has not been completing assignments. A phone conversation with his mother revealed no useful information. The most appropriate thing for Jim's teacher to do is: (MC) I. She should impress upon him the importance of finishing his assignments since he needs to learn this material for his own good. (HA) '2. Let him know that he doesn't have to finish all of his work now and see if she can help him work out the cause of the listlessness. (HC) IS. Make him stay after school until the day's assignments are done. (MA) 4. Let him see how he compares with the other children in terms of his assignments and encourage him to catch up with the others.

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CHAPTER 2

DOES OBSERVED CONTROLLING TEACHING BEHAVIOR RELATE TO STUDENTS' MOTIVATION IN PHYSICAL EDUCATION?

De Meyer, J., Tallir, I.B., Soenens, B., Vansteenkiste, M., Aelterman, N., Van den Berghe, L., Speleers, L., & Haerens, L.

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Self-Determination Theory (SDT) has served as a theoretical framework for considerable research on teaching behavior and student motivation. The majority of studies have focused on need-supportive teaching behavior at the expense of need-thwarting teaching behavior (i.e., the "dark side" of teaching). The goal of the present study was to examine motivational dynamics involved in controlling teaching behavior in the context of physical education (PE). The majority of studies on observed teaching behavior were conducted in the laboratory. To augment the ecological validity in the present study the behavior of PE teachers was videotaped as to rate their controlling teaching behavior in a real-life setting. In a sample of 56 teachers and 702 secondary school students, controlling teaching behavior during a specific PE class, as observed by external raters, was related positively to students' perceived controlling teaching behavior and, through these perceptions, to controlled motivation and amotivation. These associations were obtained in spite of the low incidence of controlling teaching behaviors, suggesting that students may be quite sensitive to controlling teaching behaviors. No associations were found between observed controlling behavior and student autonomous motivation and students' perceptions of autonomy-supportive teaching. Practical implications and recommendations for PE teachers' professional development training are included.

Keywords: self-determination theory, psychological needs, teaching style, motivation, physical education

1 Introduction

"Come on Dean, just throw and catch (irritated). A boy of your age should be able to do this naturally. NO, NO, NO … STOP, NOT GOOD, come over here …"

In both early and contemporary research on student motivation, it is recognized that teachers' way of interacting with students is of major educational importance as it affects students' enjoyment, learning, and engagement (e.g., Baird, 1973; Hamre & Pianta, 2001; Wentzel, 2002). A large number studies on the topic of teaching style have been conducted against the background of Self-Determination Theory (SDT; Deci & Ryan, 2000), a broad theory on human motivation with applications in the context of education generally (e.g., Reeve, 2009; Vansteenkiste, Lens, & Deci, 2006) and in the context of physical education more specifically (e.g., Ntoumanis & Standage, 2009).

In SDT, autonomy-support is considered a key dimension of teaching style. Autonomy-supportive teachers try to foster students' sense of volition and willingness to put effort in their studying (Reeve, 2009). In contrast, and as illustrated in the introductory example, controlling teachers make use of pressuring tactics to make students think, feel, or behave in a specific way, thereby bypassing the students' viewpoint (Reeve, 2009; Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012). The degree to which teachers adopt an autonomy-supportive or relatively more controlling style is considered an important source of influence on the quality of students' motivation. Research in the context of PE has furthermore shown that high-quality motivation for PE is a determinant of both activity levels and engagement in class (e.g., Aelterman et al., 2012) and the degree to which students adopt an active lifestyle outside of PE classes (Haerens, Kirk, Cardon, De Bourdeaudhuij, & Vansteenkiste, 2010).

Although several studies have examined the correlates of an autonomy-supportive teaching style, fewer have focused explicitly on the effects of controlling teaching. This study focuses on controlling teaching as such because it is increasingly recognized in SDT that the presence of controlling behavior cannot be equated simply with the absence of autonomy-supportive behavior (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011). Controlling socialization would be characterized by relatively specific dynamics that deserve to be studied in their own right (Vansteenkiste & Ryan, 2013).

Moreover, the few studies that addressed the role of controlling teaching style typically relied on student self-reports of teaching behaviors. Unfortunately, although convenient, self-reports may yield a response bias, thereby artificially inflating obtained relationships between teaching behavior and motivational outcomes. Therefore, observations of teaching behavior are of added value as they allow one to examine hypotheses concerning controlling teaching in a more conservative fashion. External observations also create the possibility to investigate the degree of convergence between observed and student perceived teaching behavior. Therefore, in the present study we observed and coded PE teachers' controlling behavior during a 50-minute class period to examine whether and how coded observations would relate to student perceptions of controlling teaching and, in turn, to students' self-reported motives for putting effort in PE. A possible advantage of observing controlling teaching behavior during PE classes rather than during regular academic classes is that there might be more opportunities to observe a broad variety of teaching behaviors in PE classes. As students are typically spread around the gym and safety issues also come into play it might be the case that teaching a PE class involves more provision of rules, instructions, monitoring, and continuous feedback than teaching a regular academic class. As such, there can be a larger variety statements that can

be rated in terms of the quality of communication. Also, PE teachers interact with students both verbally and physically, again possibly resulting in a broader repertoire of teaching behaviors that can be rated in terms of their controlling character.

1.1 Basic Psychological Needs and Student Motivation for PE

Central to SDT is the formulation of three basic psychological needs (Ryan & Deci, 2002; Vansteenkiste, Niemiec, & Soenens, 2010). Specifically, the needs for autonomy (i.e., experiencing a sense of volitional and psychological freedom), competence (i.e., experiencing a sense of effectiveness), and relatedness (i.e., experiencing closeness and mutuality in interpersonal relationships) have been identified as fundamental psychological nutriments for optimal functioning and well-being, both at the interindividual (e.g., Adie, Duda, & Ntoumanis, 2012) and intraindividual level (e.g., Ryan, Bernstein, & Brown, 2010). Furthermore, SDT posits that, in the case of frustration of the three basic psychological needs, people are likely to become vulnerable to ill-being and even pathology (e.g., Verstuyf, Vansteenkiste, Soenens, Mouratidis, & Boone, 2013).

Over the past few years, it has become increasingly clear that need satisfaction and need frustration should be differentiated. Although at first sight it may seem as if need frustration is exactly the opposite of need satisfaction, with both representing the opposite poles of a single continuum, increasingly it is recognized that need frustration cannot be equated with low need satisfaction. Indeed, the lack of fulfillment of the psychological needs does not by definition imply that the needs are actively frustrated (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011; Sheldon & Gunz, 2009). To illustrate, although a student may not feel very connected to his peers during a class (low relatedness satisfaction), this does not imply that he or she feels rejected or excluded by them (high relatedness frustration). The distinction between need satisfaction and frustration is more than just a

conceptual issue because both processes would relate to relatively specific developmental antecedents and educational outcomes (Vansteenkiste & Ryan, 2013). That is, whereas need satisfaction would relate primarily to well-being, performance, and adjustment (e.g., class engagement), need frustration would be primarily predictive of ill-being, indicators of psychopathology and disruptive, antagonistic behavior. Consistent with this notion, Bartholomew, Ntoumanis, Ryan, and Thøgersen-Ntoumani (2011) found that, in different samples of athletes, need satisfaction related relatively specifically to vitality and positive affect, whereas need frustration related relatively specifically to depressive symptoms, burnout, and disordered eating. Similar results were reported by Balaguer et al. (2012) in a sample of adolescent soccer players.

Much like need satisfaction and need frustration would relate differentially to well-being and ill-being, according to SDT both processes would have differential implications for the quality of students' motivation. Need satisfaction is hypothesized to give rise to high-quality motivation, that is, autonomous motivation (Deci & Ryan, 2000). In contrast, need frustration is assumed to lead to the adoption of suboptimal motivational orientations, in particular controlled motivation and amotivation (Deci & Ryan, 2000).

According to SDT, autonomous motivation can take at least two different forms. Intrinsic motivation occurs when students engage in an activity for the sake of the enjoyment and challenge experienced in the activity itself. For instance, students are intrinsically motivated when they enjoy playing basketball and experience challenge and fun while practicing a shooting technique. Identified motivation occurs when students understand and endorse the value of an activity, although they may not necessarily find the activity enjoyable as such. For instance, students might participate in PE exercises to improve their personal fitness. Because in both cases students experience a sense of volition

and psychological freedom during activity engagement, intrinsic and identified motivation are often taken together to form a composite score of autonomous motivation (Deci & Ryan, 2000).

Like autonomous motivation, controlled motivation can take at least two forms (Deci & Ryan, 2000). In the case of external regulation, one acts because one is pressured from the outside, such as by a desire to obtain rewards, to avoid punishments, or to meet external obligations. For instance, students may cooperate during PE lessons because they are afraid of threatening punishments such as having to do push-ups or sit-ups if they do not cooperate. In the case of introjected regulation, students act out of internal pressures, such as the avoidance of guilt, shame or anxiety, or attempt to bolster their own self-worth. For instance, students might cooperate to prove that they are "good athletes". Although controlled motivation brings feelings of pressure and tension and represents a less than optimal type of motivational regulation, it does involve a certain goal-directedness and intentionality. This is not the case with amotivation, an orientation where people do not see any reason to act in a particular way. This may for instance be the case because students feel incompetent in performing an activity (Deci & Ryan, 2000).

In an educational context, controlled motivation and amotivation have been shown to relate to maladaptive outcomes, including ill-being, lowered performance, and school dropout (e.g., Assor, Vansteenkiste, & Kaplan, 2009; Vallerand, Fortier, & Guay, 1997). In the context of PE, both controlled motivation and amotivation have been shown to predict maladaptive outcomes such as decreased effort and reduced class engagement (e.g., Aelterman et al., 2012) and the absence of transfer of physical activity from the PE context to leisure time (e.g., Haerens et al., 2010; Ntoumanis, 2001; Standage, Duda, & Ntoumanis, 2003). Given the maladaptive outcomes that are associated with controlled motivation and

amotivation, an important question is whether and how teaching behavior affects students' motivation during physical education. In SDT, a controlling interpersonal style is considered an important antecedent of these dynamics (e.g. Ryan & Deci, 2000).

1.2 Autonomy-Supportive and Controlling Teaching Styles

Consistent with the notion of the needs, SDT defines three dimensions of teachers' interpersonal style. That is, through their interpersonal style teachers can either support or thwart students' needs for relatedness, competence, and autonomy (Deci & Ryan, 1987; Grolnick, Benjet, Kurowski, & Apostoleris, 1997; Ryan & Deci, 2006)[1]. First, relatedness-supportive (i.e., warm, friendly, responsive, involved) interactions are contrasted with cold, unfriendly, indifferent, and distant interactions (e.g., Soenens, Duriez, Vansteenkiste, & Goossens, 2007). Second, a well-structured and competence-enhancing style is contrasted with a chaotic style (e.g., Jang, Reeve, & Deci, 2010; Vansteenkiste et al., 2012). Third, and most germane to the topic of this paper, SDT distinguishes between an autonomy-supportive and a controlling teaching style. Autonomy support refers to a style where socialization figures identify, nurture, and develop students' inner motivational resources so that students perceive themselves as the initiator of their actions (Reeve, 2009). Autonomy-supportive teachers take the students' perspective, offer choices, and encourage initiative. Also, they demonstrate the intrinsic value of activities (e.g., by including fun-elements and participating themselves) and they provide a meaningful rationale to explain the usefulness

[1] We would like to clarify our usage of the terms need frustration and need thwarting a bit more. As noted by Vansteenkiste and Ryan (2013), need thwarting refers to socialization figures' (e.g., teachers) actual or perceived behaviors, that is, what they do (or are perceived to do) to thwart students' needs (e.g., using controlling language, guilt-induction …). Need frustration in contrast refers to students' personal experiences during PE activities, such as pressure (as a manifestation of a frustrated need for autonomy), alienation (as a manifestation of a frustrated need for relatedness), and inadequacy (as a manifestation of a frustrated need for competence). Need thwarting teacher behaviors represent only one source of influence on student experiences of need frustration. Other potential sources of influence may be features of the child (such as personality, interests, and physical ability) and other socialization figures (e.g., peers and parents).

of activities in the class. Numerous studies have shown that teacher autonomy support is associated with high-quality motivation (e.g., Soenens & Vansteenkiste, 2005) and a host of desirable educational outcomes, including autonomy need satisfaction (Reeve & Jang, 2006), engagement (Assor, Kaplan, & Roth, 2002; Reeve & Jang, 2006), school performance (Soenens & Vansteenkiste, 2005), and enjoyment (Reeve & Jang, 2006). Similarly, perceived autonomy-supportive teaching during PE is related to adaptive outcomes, such as enjoyment (Yli-Piipari, Watt, Jaakkola, Liukkonen, & Nurmi, 2009) and effort-expenditure during PE (Ntoumanis, 2001) and intentions to be physically active outside PE (i.e., during leisure time; Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003).

Autonomy-supportive teaching is contrasted with a controlling teaching style, where teachers largely dismiss students' perspectives and pressure students to think, act, or feel in particular ways (Reeve, 2009). According to SDT, a controlling style can be expressed in at least two different ways, that is, externally or internally controlling (Ryan, 1982; Soenens & Vansteenkiste, 2010). Externally controlling teaching refers to the activation of a sense of external obligation in students by using rather overtly, observable controlling strategies, such as punishments, pressuring rewards, and explicitly controlling language, like "you must" (e.g., Reeve & Jang, 2006). Internally controlling teaching refers to the use of tactics that trigger internally pressuring (i.e., introjected) forces in learners by appealing to students' feelings of guilt, shame, anxiety, and self-worth. An exemplary statement of a teacher provoking internal pressure would be: "Everyone should be able to do the following exercise. Even a toddler could do it" (Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005). The activation of those internal pressures may also happen in a relatively covert and subtle way, for instance through the facial display of disappointment or the withdrawal of attention when students fail to meet certain standards (Soenens & Vansteenkiste, 2010).

Much like need frustration cannot be simply equated with an absence of need satisfaction, it is increasingly recognized in SDT that controlling teaching (which represents a feature of a need thwarting interpersonal style) cannot be equated simply with low autonomy-support (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011; Vansteenkiste & Ryan, 2013). When teachers do not explicitly provide choices and do not actively encourage initiative (i.e., are low in autonomy-support), this does not imply automatically that they actively thwart the students' need for autonomy (e.g., using pressuring language and punishments). Given that controlling teaching is not by definition the same as low autonomy support, it deserves to be studied in its own right. Relative to studies addressing autonomy-supportive teaching, however, fewer studies have explicitly addressed the dynamics involved in controlling teaching. In the general educational context, Assor, Kaplan, Kanat-Maymon, and Roth (2005) found that perceived controlling teaching was related to controlled motivation, amotivation, negative affect in the classroom, and low school engagement. Similarly, Soenens et al. (2012) showed that perceived controlling teaching was related to poorer quality of motivation to study, which, in turn, related to less use of learning strategies and lower grades.

The present study, then, attempted to add to the small body of research on controlling teaching by addressing three of its limitations. First, most studies have relied on student reports of teaching behavior, which is logical in light of SDT's assumption that subjective experiences of teacher control ultimately determine student motivation and engagement. Although some studies have relied on teacher reports of their need-supportive teaching behaviors, thereby contrasting these teacher-reports with students' self-reports of those behaviors (e.g., Taylor, Ntoumanis, & Standage, 2008; Taylor, Ntoumanis, Standage, & Spray, 2008), to the best of our knowledge no such studies have dealt with controlling

teaching behaviors in particular. The dominant reliance on student report measures in the majority of past work yields two disadvantages, that is, (a) it may cause problems of shared method variance, such that associations obtained perceived controlling teaching and student outcomes get inflated artificially and (b) it prevents one from examining whether and to what extent observed controlling teaching behavior is equally perceived as controlling by the students. For this reason, we obtained both ratings of observed behavior and student self-reports of controlling teaching in the present study.

Second, the few studies that included observations made use of ratings on a bipolar scale where controlling teaching was contrasted *a priori* with autonomy-supportive teaching (e.g., Reeve, Jang, Carrell, Jeon, & Barch, 2004), such that no unique score for observed controlling teaching could be derived (but see Reeve & Jang, 2006 for an exception). To address this limitation, a measure of observed controlling behavior is required.

A final limitation of past work on controlling teaching behavior (Deci, Spiegel, Ryan, Koestner, & Kauffman, 1982; Reeve & Jang, 2006) is that most studies were conducted in the laboratory, where pairs of individuals were instructed to take up either the role of a teacher or a student. In the present study, we videotaped PE lessons in real-life rather than in laboratory circumstances and we observed the behavior of PE teachers, which considerably augmented the ecological validity of the obtained findings.

1.3 The Present Study

In the present study, we made use of the observational ratings of controlling teaching during a specific PE class and we assessed students' perception of controlling teaching as well as their type of motivation for the past PE class. We addressed three research aims. First, we examined whether observed controlling teaching behavior related to student perceptions of controlling teaching behavior and to low-quality student motivation for PE, as

manifested in controlled motivation and amotivation. Second, we examined the degree of specificity in the associations between observed controlling teaching and maladaptive motivational outcomes (i.e., controlled motivation and amotivation). Specifically, we examined whether observed controlling teaching would be related uniquely to perceived controlling teaching and maladaptive motivational outcomes or whether, on top of that, controlling teaching behavior would also relate negatively to adaptive motivational processes, that is, perceptions of autonomy-supportive teaching and autonomous motivation for PE. As discussed before, dynamics of contextual need thwarting might be relatively specific and may be, at least to some extent, distinct from dynamics of need support. In line with this, Bartholomew, Ntoumanis, Ryan, Bosch, & Thogerson-Ntoumani (2011) and Balaguer et al. (2012) found that a controlling coaching style had unique associations with athletes' experiences of need frustration and was unrelated to experiences of need satisfaction. Given these results, we anticipated that observed controlling teaching would primarily relate to maladaptive motivational outcomes. Finally, it was investigated whether perceived controlling teaching would play an intervening role in the associations between observed controlling teaching and motivational outcomes. This hypothesis is based on the argument that students' perceptions of socialization figures' behavior (rather than the actual behavior) ultimately determine the students' outcomes (e.g., Lamborn, Mounts, Steinberg, & Dornbusch, 1991).

In examining these research questions we relied on a sample of students with a broad age range (varying between grades 7-12), which allowed us to also consider the role of developmental differences. This seems important as past research on developmental changes in students' motivation for PE has typically shown a decline in autonomous motivation across middle and high school (e.g., Digelidis & Papaioannou, 1999; Ntoumanis,

Barkoukis, & Thogersen-Ntoumani, 2009), while less systematic evidence was obtained for changes in controlled motivation and amotivation. Specifically, we examined both (a) the direct association between students' grade and motivational constructs and (b) the moderating role of grade in associations between controlling teaching and the motivational constructs. The latter was deemed important because some research suggests that, as children grow older, they become more inclined to perceive socialization figures' involvement in school as intrusive and as signaling incompetence (e.g., Pomerantz & Eaton, 2000). Hence, it deserves to be explored whether, with increasing age, students would perceive teachers' behaviors as increasingly controlling, as would be reflected in an increasingly strong association between observed and perceived controlling teaching. As a consequence, with increasing age students may also respond more negatively to both observed and perceived controlling teaching, such that the association with adverse motivational outcomes (i.e., controlled motivation and amotivation) strengthens with increasing grade level.

2 Method

2.1 Participants

In the initial sample[2] 809 students were recruited from 56 classes out of the same number of schools located in Flanders (Flemish speaking part of Belgium). For nine students (1%) the parents refused to sign the informed consent and 98 students (10%) were absent at the moment of the data collection. All students provided signed informed consent themselves. This resulted in a sample of 56 teachers and 702 students. The teachers were on

[2] The sample used in this study is part of a larger dataset. The videotapes used in the present study were also used in the study of Haerens et al. (2013). In the Haerens et al. (2013) paper, however, only findings on dimensions of need supportive teaching behavior (i.e., involvement, structure, and autonomy-support) were reported, whereas the present study focuses on need thwarting teaching behavior.

average 39 years old (*SD*=11 years, ranging from 21 to 56 years), 67% were men, and teachers had an average teaching experience of 16 years (*SD*=11, ranging from 0 to 35 years). Almost half of the sample (49%) was female and students had a mean age of 14.44 years (*SD*=1.81, ranging from 11 to 21 years). We sampled students in every grade of secondary school which in Belgium (Flanders) encompasses grades 7 through 12. The total sample contained a comparable number of students in each grade (grade 7 (n=124, M_{age}=12.06±.57), grade 8 (n=126, M_{age}=13.02±.55), grade 9 (n=140, M_{age}=14.07±.71), grade 10 (n=112, M_{age}=15.29±.78), grade 11 (n=126, M_{age}=16.20±.66), grade 12 (n=74, M_{age}=17.14±.73). Of the participating students, 68% followed an academic track, 23% followed a technical track, and 9% followed a vocational track. Students were either in co-educational (64%) or in single sex PE classes (25% boys, 11% girls), with each class containing on average 16 students (*SD*=4, ranging from 3 to 23). The lesson content of the observed lessons was categorized as interactive games (39%) or individual sports lessons (61%).

2.2 Procedure

In Flanders, PE class is compulsory for all secondary school students and is taught for two 50-minute lessons each week by specialized PE teachers. In some schools PE lessons are combined into one single 100-minute lesson. For the present study, data were gathered in a randomly chosen PE lesson. Two weeks prior to this lesson all students received an informed consent form to be signed by their parents. The informed consent form explained the study purposes and asked for parents' authorization for their child to be videotaped and to fill out the questionnaires immediately after the lesson. As the entire lesson was videotaped by means of digital camcorders, students who did not return a signed informed consent form did not participate in the observed lesson. The camcorder was positioned on a fixed spot in the gymnasium before the PE lesson started. The camcorder was set up in a way as to

capture a large viewing angle such that all students and the PE teacher could be recorded simultaneously. Additionally, teachers were equipped with a small microphone fixed on their shirt to capture instructions and teacher-student interactions. Teachers were asked to give their PE lessons as they would do normally and they were told that the main focus of the study would be on students' behavior. The study protocol was approved by the Ethical Committee of Ghent University.

2.3 Measures

Observed controlling teaching behavior. In an independent sample (i.e., a sample that did not overlap with the current sample), Van den Berghe et al. (2013) developed an observation tool for assessing need-thwarting teaching behavior. In the present study we only used the scale for controlling teaching behavior, which consists of 7 items (see Appendix). Testifying to the validity of this scale, Van den Berghe et al. (2013) showed that the items from this scale loaded on a separate factor than items reflecting other features of need-thwarting teaching (i.e., coldness and chaos). To assess interrater reliability of the need-thwarting observation items, three trained observers independently coded 30 identical videotaped PE lessons. To assess intrarater reliability, one observer coded 20 lessons twice, with two weeks in between both ratings. The raters were familiar with both SDT and research on PE and they were involved in the development of the coding instrument from the very beginning. Intrarater and interrater reliabilities were calculated by means of intraclass correlation coefficients (ICC), thereby using a two-way random model. Van den Berghe et al. (2013) provided evidence for adequate interrater reliability (.87), intrarater reliability (.95), and internal consistency (.80). Finally, observed controlling teaching was related in a theoretically plausible way to a measure of teachers' motivational orientation, with teachers with a controlled orientation displaying more controlling behavior.

For the purpose of the present study, the items for controlling teaching behavior were coded by one of three external observers every 5 minutes of each PE lesson using a 4-point scale, with the following answering categories 0=*never observed*, 1=*sometimes observed*, 2=*often observed* and 3=*observed all the time*. On average 7.66 (*SD*=2.91) intervals were coded per lesson and in total 429 5-minute intervals were coded. A score for controlling teaching behavior was created by averaging the scores on the individual items. This score had a Cronbach's alpha of .73 and had a mean of .22 (*SD*=.23 range between 0.00 and 1.05) on a scale from 0-3.

Students' perceptions of teaching behavior. To assess students' perceptions of controlling teaching, we used a 9-item scale. The items were administered immediately following the PE class and were formulated specifically with reference to this class. Seven items were from the Psychologically Controlling Teaching (PCT) scale (Soenens et al., 2012) and two items were from the Teacher As Social Context Questionnaire (TASCQ; Skinner & Belmont, 1993). The internal consistency and validity of the PCT scale (e.g. "During this class the teacher made me feel guilty when I dissatisfied him/her") was demonstrated by Soenens et al. (2012). The reason why we added two items from the TASCQ (i.e., "During this class it seemed like my teacher was always telling me what to do" and "During this class my teacher often criticized me on how I do the things during class") is that we aimed to obtain a more global and broader index of perceived controlling teaching while the PCT scale mainly taps into internally controlling teaching behaviors in particular (Soenens & Vansteenkiste, 2010). The two items from the TASCQ are more general and also reflect more externally controlling teaching. Because these items tap into controlling teaching, they are usually reverse scored and added to the autonomy-support items of the TASCQ. In the current study we did not reverse scored these items and instead added them to the 7 items of the PCT scale to obtain

a general measure of perceived controlling teaching. An exploratory factor analysis indicated that all 9 items loaded on one factor, explaining 51.45% of the variance and factor loading ranging between .62 and .77. Cronbach's alpha of the resulting 9-item scale was .88 and the average score was 1.93 (*SD* = 0.76, ranging between 1.00 and 5.00).

To assess students' perceptions of autonomy-supportive teaching behavior, we used the remaining six items from the TASCQ autonomy-support scale (e.g. "During this class my teacher gave me a lot of choices about how to do the exercise"). Items of both questionnaires were rated by students on a 5-point Likert scale from 1 (*not true for me*) to 5 (*very true for me*). The average score of perceived autonomy-support was 2.86 (*SD* = 0.81, ranging between 1.00 and 5.00). Cronbach's alpha was .79.

Students' motivation for PE. To measure students' motivation specifically with regard to the lesson they just followed, they were administered the validated Behavioral Regulations in Physical Education Questionnaire (BRPEQ; Aelterman et al., 2012). We used the stem "I put effort in this past physical education class because …", which was followed by items reflecting autonomous motivation (8 items; e.g. "I enjoy this PE class") and controlled motivation (8 items; e.g. "I have to prove myself"). In addition, students filled out items tapping into amotivation as experienced during the class (4 items; e.g. "I don't see why this PE class is part of the curriculum").[3] Items were rated on a 5-point Likert scale from 1 (*not true for me*) to 5 (*very true for me*). Cronbach's alphas of these three scales were .89, .86, and .81, respectively.

[3] In this study we did not include a measure of integrated regulation, a third type of autonomous motivation next to identification and intrinsic motivation. This decision was informed by both methodological and substantive reasons. First, integrated regulation is not usually assessed in research on adolescents, since it requires a high degree of introspection and self-awareness and is hardly empirically distinguishable from identified and intrinsic regulation through self-reports in children and adolescents (Vallerand & Fortier, 1998). Second, in the present study students' motivation was measured specifically with regard to the lesson students just followed. As integrated regulation requires coherence across situations and even different domains in life (Ryan & Deci, 2000), it is hard to assess integrated motivation with regard to reasons for participation in one specific lesson.

2.4 Plan of Analyses

Multilevel regression analyses were employed for all analyses using MLwiN version 2.25 (Rasbash, Steele, Browne & Goldstein, 2009). Data were treated as a two-level hierarchical model, consisting of students at Level 1 and classes at Level 2. Gender was included as a covariate at Level 1 and grade, gender composition of the class, educational track, class size, and lesson topic were included as covariates at Level 2. All quantitative explanatory variables were grand mean centered before they were entered in the predictor models.

Associations between observed and perceived controlling teaching behavior (i.e., controlling and autonomy-supportive) and students' motivation (i.e., controlled motivation, autonomous motivation, and amotivation) were examined in a series of multilevel regression analyses. These multilevel regression analyses consisted of the following three steps. In Step 1, the baseline variance components model (Rasbash et al., 2009) or intercept-only model (Hox, 2010) was estimated for students' perceptions and motivation with only an intercept and no explanatory variables (i.e., Model 0). This allowed us to evaluate the percentage of variation in students' perceptions and motivation situated at the student and class level and it provided the null model to compare gradually more complex models in the subsequent steps. In Step 2, five covariates (i.e., students' gender, grade, gender composition, educational track, class size and topic of the lesson) were included in the models (Model 1). In Step 3, observed controlling teaching behavior was entered as a predictor of each of the student variables (i.e., Model 2). In a final model (i.e., Model 3), we also added the interaction between grade and observed controlling teaching behavior as a predictor of students' perceptions and motivation.

In an additional set of analyses we examined the intervening role of perceived controlling teaching behavior in the association between observed controlled teaching behavior and controlled motivation and amotivation. To test the significance of indirect effects, we used the product-of-coefficient test (MacKinnon, Fairchild & Fritz, 2007), which tests the significance of the product of two regression coefficients a*b. The a-path represents the association between observed and students' perceived controlling teaching behavior. The b-path represents the association between perceived controlling teaching behaviors and student motivation, while simultaneously adjusting for the relation between observed controlling teaching and student motivation. The indirect effect is significant when the 95% confidence interval (CI) does not contain zero. In case there was an initial direct association between observed controlling teaching and students' motives (i.e., the c-path), we also inspected whether this c-path would be diminished or reduced to non-significance when adding perceived controlling teaching to the equation (i.e., the c'-path).

Given that perceived controlling teaching behavior and motivation were measured at the student level (Level 1) while the antecedent variable (i.e., observed controlling teaching behavior) was measured at the class level (Level 2), a specific statistical procedure was applied to ensure that the a-path and b-path were estimated at the same level (in this case Level 2) (Zhang, Zyphur, & Preacher, 2009). That is, perceived controlling teaching behavior and student motivation (i.e., the two Level 1 or within-group variables) were decomposed into a between-group (Level 2) and within-group variable (Level 1), so that, similar to the estimation of the a-path, also the b-path could be estimated at the class level (Level 2). For instance, the between-group variable consisted of the average class score for perceived controlling teaching, meaning that all students within the same class received the same score, so that variability in this variable involved uniquely between-class variation. For the

within-group level, the mean score of the class was subtracted from the students' individual scores, so that this score represented uniquely the variability of individual scores within classes. Both variables were entered into the regression analyses and the regression coefficient of the between-group variable was used in the calculations for the analyses of indirect effects (Zhang et al., 2009). In testing the intervening role of perceived controlling teaching we controlled for background variables that were found to have significant effects in Step 2 of the initial series of multilevel regressions.

3 Results

We first estimated the baseline variance components model for perceived controlling teaching and students' controlled motivation and amotivation. For perceived controlling teaching, the null-model showed an intercept value of 1.97 (0.05), indicating that the average level of perceived controlling teaching was low. Both class-level variance and student-level variance were significantly different from zero, with 18.34% ($\chi2$=14.45, *df*=1, *p*<.001) of the variance in perceived controlling teaching situated at the class level. As for students' controlled motivation and amotivation, the null-models indicated intercept values for of 1.88 (.05) and 1.76 (.05), respectively, suggesting that scores on low-quality motivation were rather low. The random parts of the null models showed that for both forms of motivation variances at both the student- and class-level were significantly different from zero. Specifically, the class level-variance was 13.24% ($\chi2$=9.18, *df*=1, *p*<.01) for controlled motivation and 9.55% ($\chi2$=8.47, *df*=1, *p*<.01) for amotivation.

Next, we estimated similar models for perceived autonomy support and autonomous motivation. The null model for perceived autonomy-supportive teaching indicated an intercept value of 2.90 (.05), with 17.33% ($\chi2$=13.66, *df*=1, *p*<.001) of the variance being situated at the class-level. As for students' autonomous motivation, the null model indicated

an intercept value of 3.55 (.05), with 10.30% ($\chi 2=11.20$, $df=1$, $p<.001$) of the variance situated at class level.

In the next step, we added the covariates (i.e., students' gender, grade, gender composition, educational track, class size and topic of the lesson) to the model. These findings are reported in Table 1 under the column 'Model 1'. Gender was related to perceived controlling teaching, controlled motivation, and amotivation, with girls perceiving their PE teachers as less controlling and displaying less controlled motivation and amotivation. Class size was related to perceived autonomy-support, with students in smaller classes perceiving their teachers as less autonomy-supportive. Grade was related to controlled motivation, autonomous motivation and perceived autonomy support, with students in higher grades displaying less controlled motivation and less autonomous motivation and also perceiving their teachers as less autonomy supportive. Students perceived their teachers as being more autonomy supportive during interactive games compared to individual sports.

More central to the present study, in the following step (i.e., Model 2), we added observed controlling teaching as a predictor of the perceived teaching style and motivational outcomes. As hypothesized, a significant positive relation was found between observed and perceived controlling teaching behavior. Also, a significant association was found between observed controlling teaching behavior and controlled motivation, but not with amotivation. Observed controlling teaching behavior was unrelated to perceived autonomy-supportive teaching and also did not relate to students' autonomous motivation. In Model 3 we added the interaction between grade and observed controlling teaching as a predictor of students' perceptions and motives. None of the interaction terms reached significance, indicating that the investigated associations were invariant across grade.

In a final set of models we tested whether observed controlling teaching behavior would be indirectly related to controlled motivation and amotivation through students' perceived controlling teaching. In these analyses we only controlled for students' gender and grade as the previous set of analyses showed that these were the only background variables with systematic significant effects on the study variables involved. Results of these analyses can be found in Table 2. First, as already shown before, the relation between observed and perceived controlling teaching behavior (a-path) was significant. Second, we investigated the relation between perceived controlling teaching behavior and motivation (controlled and amotivation), while statistically controlling for observed controlling teaching. In doing so, we estimated both between-group and within-group relationships, with the between-group relationship representing the crucial b-path to estimate the indirect effect. Both the between-group and the within-group relation between perceived controlling teaching behavior and controlled motivation and amotivation were significant. Subsequent analyses using the product-of-coefficient test (MacKinnon et al., 2007) revealed that the indirect association between observed controlling and controlled motivation through perceived controlling teaching was significant (a*b = .25, SE=.11, Z=2.34, p<.05). Given that observed controlling teaching yielded an initial direct association with controlled motivation (c-path), we tested whether this association would fall below significance after including perceived controlling teaching (c'-path). This was the case, suggesting that the effect of observed controlling teaching on controlled motivation was fully indirect via perceived controlling teaching. The indirect pathway between observed controlling teaching behavior and amotivation through perceived controlling teaching behavior (a*b = .20, SE=.09, Z=2.15, p<.05) was also significant.

Table 1

Summary of the Model Estimates for the Two-Level Analyses of the Associations Between Observed Controlling Teaching and Student Perceived Teaching and Motivational Outcomes.

	Students' perceived controlling teaching behavior			Students ' controlled motivation			Students' amotivation		
Parameter	Model 1 (a)	Model 2	Model 3	Model 1 (b)	Model 2	Model 3	Model 1 (c)	Model 2	Model 3
FIXED PART	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*
Intercept	2.28 (0.12)	2.26 (0.12)	2.24 (0.12)	2.07 (0.12)	2.05 (0.12)	2.02 (0.12)	2.01 (0.13)	1.97 (0.13)	2.01 (0.13)
Students' gender (girl)[a]	-.44 (0.07)***	-.43 (0.07)***	-.43 (0.07)***	-.24 (0.08)**	-.23 (0.08)**	-.24 (0.08)**	-.22 (0.09)*	-.21 (0.09)*	-.21 (0.09)*
Grade	-.05 (0.03)	-.05 (0.03)	-.05 (0.03)	-.09 (0.03)**	-.09 (0.03)**	-.09 (0.03)**	-.06 (0.03)	-.05 (0.03)	-.05 (0.03)
Girls only[b]	-.23 (0.19)	-.19 (0.19)	-.16 (0.20)	-.31 (0.20)	-.27 (0.20)	-.22 (0.20)	-.14 (0.22)	-.13 (0.22)	-.16 (0.23)
Gender composition[b]	-.22 (0.12)	-.18 (0.11)	-.17 (0.12)	-.21 (0.12)	-.16 (0.12)	-.14 (0.12)	-.19 (0.13)	-.17 (0.13)	-19 (0.13)
Technical track[c]	.02 (0.12)	-.04 (0.11)	-.04 (0.11)	.03 (0.12)	-.04 (0.12)	-.03 (0.12)	.09 (0.13)	.07 (0.13)	.06 (0.13)
Vocational track[c]	-.16 (0.18)	-.12 (0.17)	-.11 (0.17)	-.20 (0.19)	-.17 (0.18)	-.15 (0.18)	.14 (0.20)	.15 (0.20)	.14 (0.20)
Class size[d]	-.02 (0.01)	-.02 (0.01)	-.02 (0.01)	-.02 (0.01)	-.02 (0.01)	-.02 (0.01)	.01 (0.01)	.01 (0.01)	.00 (0.01)
Topic (interactive games)[d]	.01 (0.09)	.00 (0.09)	.00 (0.09)	.10 (0.10)	.09 (0.09)	.09 (0.09)	-.03 (0.10)	-.04 (0.10)	-.04 (0.10)
Observed controlling teaching		.38 (0.19)*	.38 (0.19)*		.44 (0.19)*	.43 (0.19)*		.18 (0.21)	.18 (0.21)
Grade X Observed controlling teaching			-.08 (0.14)			-.13 (0.14)			.08 (0.16)
RANDOM PART									
Class level variance	.05 (0.02)**	.04 (0.02)**	.04 (0.02)*	.05 (0.02)*	.04 (0.02)*	.04 (0.02)*	.04 (0.02)	.04 (0.02)*	.04 (0.02)*
Student level variance	.44 (0.03)***	.44 (0.03)***	.44 (0.03)***	.52 (0.03)***	.52 (0.03)***	.52 (0.03)***	.73 (0.04)***	.73 (0.04)***	.73 (0.04)***
Deviance test model	1230.55	1226.71	1226.38	1326.03	1321.31	1320.45	1509.51	1508.81	1508.55
χ2(df)		3.84 (1)	4.17 (2)		4.72 (1)*	5.58 (2)		0.70 (1)	0.96 (2)

Table 1 (continued)

	Students' perceived autonomy support			Students' autonomous motivation		
Parameter	Model 1 (d)	Model 2	Model 3	Model 1 (e)	Model 2	Model 3
FIXED PART	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*
Intercept	2.72 (0.11)	2.72 (0.11)	2.72 (0.12)	3.48 (0.13)	3.49 (0.13)	3.46 (0.13)
Students' gender (girl)[a]	-.10 (0.08)	-.10 (0.08)	-.10 (0.08)	-.11 (0.09)	-.11 (0.09)	-.12 (0.09)
Grade	-.11 (0.03)***	-.11 (0.03)***	-.11 (0.03)***	-.11 (0.03)***	-.11 (0.03)***	-.11 (0.03)***
Girls only[b]	-.15 (0.19)	-.14 (.19)	-.15 (0.20)	.02 (0.22)	.01 (0.22)	.07 (0.23)
Gender composition[b]	-.03 (0.11)	-.03 (0.12)	-.03 (0.12)	.05 (0.13)	.04 (0.13)	.06 (0.13)
Technical track[c]	.02 (0.11)	.01 (0.11)	.01 (0.11)	-.11 (0.13)	-.09 (0.13)	-.09 (0.13)
Vocational track[c]	-.14 (0.18)	-.14 (0.18)	-.14 (0.18)	.00 (0.20)	-.01 (0.20)	.01 (0.20)
Class size	-.06 (0.01)***	-.06 (0.01)***	-.06 (0.01)***	-.03 (0.01)	-.02 (0.01)	-.02 (0.01)
Topic (interactive games)[d]	.38 (0.09)***	.38 (0.09)***	.38 (0.09)***	.13 (0.10)	.13 (0.10)	.13 (0.10)
Observed controlling teaching		.06 (0.19)	.06 (0.19)		-.13 (0.22)	-.14 (0.21)
Grade X Observed controlling teaching			.01 (0.14)			-.13 (0.16)
RANDOM PART						
Class level variance	.03 (0.02)*	.03 (0.02)*	.03 (0.02)*	.04 (0.02)*	.04 (0.02)*	.04 (0.02)
Student level variance	.55 (0.03)***	.55 (0.03)***	.55 (0.03)***	.68 (0.04)***	.68 (0.04)***	.68 (0.04)
Deviance test model	1335.18	1335.07	1335.07	1469.25	1468.87	1468.21
χ2(df)		0.11(1)	0.11(2)		0.38 (1)	1.04 (2)

Note. Beta coefficients are unstandardized and values in parentheses are standard errors. Intercept Model 1 represents (a) the mean students' perceived controlling teaching behavior, (b) controlled motivation, (c) amotivation, (d) students' perceived autonomy support, and (e) autonomous motivation score for boys from an average grade in a general educational track with only boys and with an average class size and during individual sports. χ2(df) = represents the difference with Deviance Test Model 1. [a] 0 = boy, 1 = girl. [b] 0 = boys only, 1 = girls only, 2 = gender composition. [c] 0 = general track, 1= technical track, 2 = vocational track. [d] 0 = interactive games, 1 = individual sports.

*p<.05; **p< .01; ***p< .001.

Table 2

The Intervening Role of Perceived Controlling Teaching in the Associations Between Observed Controlling Teaching Behavior Students' Motives.

	c-path		c'-path		a-path		b-path		a*b	
	B (S.E.)	95% CI	*B (S.E.)*	95% CI	*B (S.E.)*	95% C	*B (S.E.)*	95% CI	*B (S.E.)*	95% CI
Controlled motivation										
Class level (=level 2)	.50 (0.18)**	.16, .85	.26 (0.14)	-.01, .53	.44 (0.18)*	.09, .78	.57 (0.09)***	.40, .74	.25 (0.11)*	.04, .46
Pupil level (=level 1)							.64 (0.03)***	.57, .71		
Amotivation										
Class level (=level 2)	.32 (0.20)	-.08, .72	.07 (0.18)	-.29, .43	.44 (0.18)*	.09, .78	.46 (0.11)***	.25, .68	.20 (0.09)*	.02, .39
Pupil level (=level 1)							.64 (0.04)***	.56, .73		

Note. Beta coefficients are unstandardized. The a-path is the association between observed and students' perceived controlling teaching behavior; b-path is the association between students' perceived controlling teaching behavior and student motivation; c-path is the initial, direct association between observed controlling teaching behavior and student motivation; c'-path is the association between observed controlling teaching behavior and student motivation adjusted for students' perceived controlling teaching behavior. CI = confidence interval.
*p<.05 **p<.01; ***p<.001.

4 Discussion

The present study focused on the outcomes of observed and student perceived controlling teaching in the context of physical education. Theoretically, controlling teaching is assumed to thwart students' needs for autonomy which, in turn, would activate the adoption of suboptimal motivational orientations, in particular controlled motivation and amotivation (Deci & Ryan, 2000). The most novel aspect of the present study involved the examination of this SDT-grounded sequence of relations using observations rather than just self-reports of controlling teaching. The reliance on rated observations allowed for a more conservative and methodologically stringent test of the hypothesized dynamics of teacher control as previously obtained associations between perceived controlling teaching and motivational outcomes could be due to shared method variance. Although a few previous studies in the SDT-literature (e.g., Deci, 1982; Reeve & Jang, 2006) made use of observations, most of these studies were conducted in more artificial laboratory circumstances. The present study, in contrast, took place in a real-life setting in which professional PE teachers were videotaped during their PE class and their controlling behaviors were rated. A number of interesting findings emerged.

When teachers more frequently engaged in controlling behaviors according to the raters, the students reported that they experienced more controlling teaching during the class and also felt more pressured to engage in the past PE lesson, as reflected in higher scores on controlled motivation. Remarkably, these associations were obtained even though the occurrence of controlling teaching behavior was quite low. As such, these results suggest that even a sporadic exposure to controlling teaching behaviors may increase students' perception of need thwarting by the teacher and prompt a more controlled form of motivation. These findings are perhaps somewhat counterintuitive as one might reason that

a certain threshold of controlling teaching behavior needs to be surpassed before these behaviors would be perceived as actually controlling by students or before the controlling behavior would affect their motivation. The present findings suggest the opposite. It seems that, although the incidence of controlling teaching behaviors was low, such behaviors are quite salient. Students seem to be sensitive to these behaviors, which may explain why these behaviors did relate to students' experiences and motivation. This is an important result because students with controlled motivation have been found to experience more boredom and unhappiness during PE (e.g., Ntoumanis, 2001; Standage, Duda, & Ntoumanis, 2005), to display reduced rated engagement (Aelterman et al., 2012), and to have a decreased likelihood to remain active during leisure time (Haerens et al., 2010).

In contrast to the findings for controlled motivation, observed controlling teaching behavior was not related directly to students' amotivation. A number of explanations can be provided. First, it might be the case that the development of amotivation requires more than only the thwarting of the need for autonomy. Possibly, for amotivation to occur, the needs for competence and relatedness need to be blocked simultaneously with the need for autonomy (Deci & Ryan, 2000). Thus, amotivation would develop when teachers behave not only in a controlling fashion but also in a way that actively thwart students' need for competence (e.g., by being critical) and relatedness (e.g., by acting in a cold and unfriendly fashion). Second and related to the previous reasoning, amotivation might develop when frustration of the needs is *chronic* and accumulates across different lessons, an issue that we could not pursue in the present research given the study only comprised a single lesson. Therefore, future research could examine whether observations of need-thwarting teaching behavior that are aggregated across classes are more strongly predictive of amotivation compared to a one-shot assessment of need-thwarting teaching behavior. Third, the lack of

association may also be due to type of amotivation that was assessed in the present study. Specifically, our scale for amotivation (e.g., 'I felt the previous PE lesson was a waste of time') tapped into a lack of concern or value for the past PE lesson (Ryan, Lynch, Vansteenkiste, & Deci, 2011). We did not assess amotivation stemming from a lack of perceived competence or positive efficacy beliefs to do the required PE activities. Perhaps then, amotivation due to a lack of valuation of the activity is rooted relatively more strongly in personal characteristics of students than in teachers' behavior. For students low on valuation of the activity, it may not really matter how the teacher behaves because they think the lesson is a waste of time anyway.

Importantly, it should be noted that amotivation was not completely unrelated to controlling teaching behaviors, as there was an indirect association between controlling behaviors and amotivation through student perceptions of controlling teaching. Hence, to the extent that students actually perceive their teachers as controlling, this does seem to increase their likelihood of experiencing amotivation. Similarly, perceived controlling teaching played an intervening role in the associations between observed controlling behavior and controlled motivation. Thus, what seems to matter most in terms of predicting motivational outcomes is the experienced control by the student, which can be predicted by what actually happens in the classroom according to external observers.

Yet, the association between observed and perceived controlling behavior is far from perfect and future research may want to examine moderating factors that determine the size of this gap. Possibly, not everyone experiences a shouting and guilt-inducing PE teacher as equally controlling. For instance, autonomously motivated students or those feeling a strong sense of relatedness with the teacher may interpret the objectively recorded controlling behaviors as relatively more informational rather than pressuring and evaluative,

such that the perceived functional significance of the behavior (Deci & Ryan, 1985) differs somewhat between students. Notably, while the gap between observed and perceived controlling behavior may be somewhat smaller for some students, the same gap could be larger for others. For instance, students high on controlled motivation or those displaying oppositional defiance vis-à-vis their teacher (Vansteenkiste, Soenens, Van Petegem, & Duriez, 2014) may be more likely than other students to perceive a particular teaching behavior as controlling, as they may more easily experience any interference in their activities as intrusive. In addition, they may also respond to perceived controlling teaching somewhat differently. That is, rather than complying with the teacher they may become apathetic, cynical, or defiant during the class.

Another aim of this study was to examine associations between observed controlling teaching behavior and perceived autonomy-support and autonomous motivation in students. Based on the growing recognition within SDT that need thwarting in general and controlling teaching in particular cannot by simply equated with an absence of need support in general or the lack of autonomy support in particular (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011), we expected that observed controlling teaching would be less strongly related to perceived autonomy-support and to students' autonomous motivation. In fact, although controlling teachers may hamper autonomous motivation, this form of motivation is thought to result especially from experiences of need support (Deci & Ryan, 2000). This expectation was confirmed, as observed controlling teaching behavior was unrelated to perceived autonomy support and students' autonomous motivation. These findings suggest that the dynamics of need thwarting, and more specifically controlling behavior, are relatively specific and are, at least to some extent, distinct from dynamics of autonomy support. Said differently, these findings suggest that for teachers to come across

as autonomy-supportive and to promote autonomous motivation, more is needed than simply refraining from controlling and need-thwarting behaviors. For instance, teachers also need to encourage initiative, to provide meaningful choices, to give a reasonable and personally meaningful rationale for activities, and to cultivate and display interest in the activities (e.g., Deci, Eghari, Patrick, & Leone, 1994; Haerens et al., 2012; Reeve, 2002).

In a more explorative fashion we also examined possible developmental differences in our study variables. Consistent with a number of previous studies (e.g., Ntoumanis et al., 2009, we found that students in higher grades reported less autonomous motivation and perceived less teacher autonomy support. We also observed a small difference between lower and higher grades in terms of controlled motivation, suggesting that any kind of motivation for PE was lower among students in higher grades. In spite of this mean-level differences in motivation, however, grade did not moderate associations between observed controlling teaching and students' perceptions and motives. These findings indicate that observed controlling teaching is related to perceived controlling teaching and suboptimal motivations for PE invariantly across grades. Given that this is the first study to examine developmental differences in the associations between observed controlling teaching and student outcomes, more research is needed to replicate our findings.

4.1 Practical Implications

One obvious recommendation following from the current findings is that it is important to raise awareness among teachers about the motivational risks associated with controlling practices and to discourage them from engaging in such practices. The observational coding system used in this study might actually be helpful in this regard, as it operationalized controlling teaching behaviors at the level of fairly specific and identifiable teaching behaviors. By providing teachers with insight into these specific behaviors (see

Appendix) they may come to a deeper understanding of what it means to be controlling, which is the starting point to begin avoiding these behaviors. On the other hand, encouraging teachers to avoid the use of controlling tactics might not be as easy as it seems on first sight. Van den Berghe et al. (2013) recently demonstrated that the use of controlling behaviors is intertwined with teachers' personality functioning. Specifically, teachers with a controlled causality orientation, that is, teachers who tend to perceive pressure more easily in their environment and who at the same time are more sensitive to the effects of pressure, were more likely to engage in controlling behaviors during PE classes. Teachers with a controlled causality orientation might be less open to change and may hesitate to decrease their engagement in controlling behaviors, an issue that deserves more attention in future research. To handle the resistance of control-oriented teachers to change their teaching style, professional development training will need to be presented in a need-supportive way to the teachers, such that teachers feel understood, are presented with options and a meaningful rationale to implement new teaching practices, and have acquired the necessarily skills to effectively implement the suggested teaching practices (Aelterman et al., 2013; Su & Reeve, 2011).

4.2 Limitations and Directions for Future Research

One important limitation of the current study is its cross-sectional design, which prevents us from drawing conclusions about the direction of effects. Most likely, the relation between observed controlling teaching and controlled motivation is bidirectional such that controlling teaching behavior evokes the students' motivation and vice versa. It would be interesting to assess controlling teaching and students' motivation and behavior at multiple occasions during one academic year or even within more limited time constraints (e.g., a single class) as to observe in greater detail the nature of the unfolding dynamics between

teacher and student behavior. Related to this, future research may examine the long-term influences of need thwarting teaching behavior. Longitudinal research may for instance provide more insight in the question whether exposure to need thwarting PE teaching behaviors at high school interferes with engagement in sports and exercise later in life.

Another limitation of our study is the relatively small and fairly homogeneous sample. Clearly, caution is warranted in generalizing the current findings and future research would do well to examine our proposed model in larger samples with more diversity in terms of, for example, class subject, level of education, and ethnicity. It would be particularly worthwhile to examine how the nature of controlling behaviors in academic classes might differ from the PE context and whether the relationships between controlling teaching behavior and students' motivation observed in the PE context also apply in academic classes. Yet, in terms of structural associations between constructs, we believe that dynamics of controlling teaching will work rather similarly in academic classes as compared to PE. Indeed, in SDT it is assumed that controlling practices undermine students' basic and universal psychological needs, and the need for autonomy in particular. On the basis of this reasoning, it can be predicted that controlling teaching will be related to suboptimal motivational outcomes across contexts and types of classes. Further, given the study was limited to one dimension of need thwarting teaching behavior, future research could examine the other need thwarting teaching behaviors (i.e., controlling, chaos and cold). This may provide more detailed insights in the associations and interactions between dimensions of need thwarting teaching behavior and students' motivation. Relatedly, although the findings of the current study suggest that dynamics of (autonomy) need thwarting are to some extent distinct from dynamics of (autonomy) need support, an important aim for future research is to further address the interplay of need thwarting and need supportive teaching behaviors. Recent

work by Van den Berghe et al. (2013) suggests that observed autonomy-supportive and autonomy-thwarting (i.e., controlling) behaviors are only modestly negatively related. This means that some teachers may display autonomy-supportive and controlling behaviors within the course of one class. It might be interesting to examine whether and how such teachers affect students' motivation and behavior compared to teachers who predominantly rely on autonomy-supportive behaviors or teachers who predominantly rely on controlling behaviors.

Finally, we assumed that the effect of perceived controlling teaching on motivation would be mediated by feelings of need frustration. However, this assumption was not actually tested and therefore further research would do well to include an explicit assessment of students need frustration in the context of PE and to examine whether need frustration is a mediator in the relationship between need thwarting teaching behavior and student outcomes.

4.3 Conclusion

This study showed that controlling teaching is not only in the eye of the beholder but, instead, can be traced back to observable teaching behaviors. Specifically, when teachers more frequently engaged in visibly controlling behaviors, students reported that they experienced their teachers as more controlling and that they felt more pressured to engage in the PE lesson. There was also an indirect association between controlling teaching behavior and amotivation. Given the maladaptive emotional and behavioral outcomes associated with these suboptimal types of motivation, the theme of controlling teaching deserves to be examined further and to be put on the agenda of teacher education in the context of PE and beyond.

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Appendix

Overview of the Items Used to Tap into Observed Controlling Teaching Behavior together with Illustrative Examples of Each Controlling Behavior

The teacher	Illustration
… exercises power over the students by interfering and demanding respect	*"Okay, we will do some abdominal exercises now. Look at my demonstration. Now do the exercise at my pace. No one stops until I say so"*
… commands students, uses controlling language and imperatives	*"Come over here! Hurry up. You two! Go get the basketballs in the storage room and do it now. I don't like waiting."*
… is irritated, loses his patience	*The teacher demonstrated some gymnastic exercises on the balance beam but Nicky is chatting around. The teacher already gave her a warning, but now he is done with it. "Nicky, start doing the exercises I demonstrated. Start doing what I asked you to do."*
… yells at the students	*"When I blow my whistle everybody stops right where you are during the tag game." Although the teacher blows his whistle after a while, some students keep on running and playing. He blows his whistle again and yells at the students: "Mary and Thomas, are you deaf?"*
… pressures the students by making an appeal to their self-confidence or pride or induces feelings of guilt and shame	*"I am really disappointed in the performance of some students of this class. You all had a lot of opportunity to practice during the past lesson. I think you all know that this exercise can be easily mastered by all of you, but I am sorry to say that I don't see a lot of progress in some of you"*
… uses destructive criticism when students are not acting in the way the teacher expects them to	*"No, no, no. Not like that. Do what I asked you to do. Keep your feet together while jumping … No, wrong again … Unbelievable, it is really not difficult to simply copy my demonstration and still you do something else."*
… does not allow input from the students or reacts negatively to their input	*One of the students asks the teacher if the students may compose the teams for the volleyball game themselves. The teacher answers: "No, that won't work. I am the one who puts together the teams."*

CHAPTER 3

THE DIFFERENT FACES OF CONTROLLING TEACHING: IMPLICATIONS OF A DISTINCTION BETWEEN EXTERNALLY AND INTERNALLY CONTROLLING TEACHING FOR STUDENTS' MOTIVATION IN PHYSICAL EDUCATION

De Meyer, J., Soenens, B., Aelterman, N., De Bourdeaudhuij, I., & Haerens, L. (in press)

Physical Education and Sport Pedagogy

Background: In Self-Determination Theory (SDT), a well-validated macro-theory on human motivation, a distinction is made between internally controlling teaching practices (e.g., guilt-induction and shaming) and externally controlling practices (e.g., threats and punishments, commands). While both practices are said to undermine students' motivation, they would do so through somewhat differential motivational processes. Unfortunately, the relevance of the conceptual distinction between internally and externally controlling strategies has not been examined systematically. In the context of sport and physical education (PE), most studies on controlling teaching have either measured controlling teaching in an undifferentiated way or have focused on one particular feature of controlling teaching.

Purpose: The purpose of this study was to provide a more fine-grained picture on the differential de-motivational effects of internally and externally controlling teaching strategies in the domain of PE.

Participants: A total of 925 students with an average age of 15.80 years ($\pm$1.99) coming out of 92 classes taught by 22 different PE teachers participated in the present study.

Data analysis: Data on perceived controlling teaching style and students' motivation were analyzed within a multilevel framework from both a variable-centered (regression analyses) and person-centered approach (cluster analyses).

Results: We found evidence for a distinction between perceived internally and externally controlling teaching. Both teaching styles were strongly related to each other (r = .54). At the level of zero-order correlations, both internally and externally controlling teaching related negatively to students' intrinsic motivation and identified regulation and related positively to introjected regulation, external regulation, and amotivation. However, when both teaching styles were included simultaneously as predictors of motivation in the regression-analyses,

only internally controlling teaching predicted poor quality and low quantity of motivation. A cluster analysis revealed different profiles of perceived controlling teaching style, with two profiles being characterized by either high or low levels of the two types of controlling teaching and other profiles displaying elevated or reduced levels of one of the types of controlling teaching. This person-centered analysis confirmed that particularly students who perceive their PE teacher as internally controlling are likely to report poor-quality motivation. *Conclusion:* Controlling teaching (and internally controlling teaching in particular) is related to maladaptive motivational outcomes. As such, it can be advised to PE-practitioners to refrain from using controlling strategies when teaching students. More research is needed to identify the conditions under which teachers' behavior is perceived as externally and/or internally controlling.

Keywords: self-determination theory, person-centered approach, teaching style, controlling, motivation, physical education

1 Introduction

Teachers vary substantially in the way they teach their classes. Sometimes teachers are open for students' perspective, encourage students' initiative, and are able to provide choices to the students, while at other moments teachers tend to adhere to their own agenda and pressure students to think, act, or feel in particular ways (Deci et al., 1994; Reeve, 2009). Whereas in the former situation teachers rely on autonomy-supportive teaching practices, in the latter situation they rely on more controlling strategies. According to Self-Determination Theory (SDT; Deci & Ryan, 2000), a well-validated macro-theory on human motivation, autonomy-supportive teaching nurtures students' basic psychological needs for autonomy (i.e., experience of volition), competence (i.e., experience of effectiveness), and relatedness (i.e., experience of closeness). This teaching style is related to students' autonomous functioning (Reeve, 2009). In contrast, a controlling teaching actively thwarts students' basic needs and leads to need frustration and maladaptive outcomes (Vansteenkiste & Ryan, 2013).

The effects of controlling teaching are said to be more detrimental than effects of a lack of autonomy support (Vansteenkiste & Ryan, 2013). Thus, it has been argued (e.g., Vansteenkiste & Ryan, 2013) and shown in several studies across a variety of domains (e.g., sport, physical education (PE) and work) that the presence of a controlling style is related specifically to maladaptive emotional and psychological outcomes, including negative affect, (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011), stress (Vansteenkiste, Zhou, et al., 2005), and work-family-life conflicts (Stebbings et al., 2012). In the context of PE, Haerens et al. (2015) demonstrated that besides the existence of a bright pathway, with autonomy-supportive teaching predicting optimal student outcomes through need satisfaction, there is

evidence for a dark pathway with controlling teaching predicting maladaptive outcomes such as need frustration and oppositional defiance.

The finding that controlling teaching has unique predictive value for maladaptive student outcomes is not only theoretically important but also relevant for practice. Specifically, this finding suggests that teachers need to be made aware of the detrimental outcomes associated with a controlling style. However, to inform teachers about the risks associated with using a controlling style, we need to gain more detailed insights into the nature and different manifestations of controlling teaching.

The relative lack of explicit attention devoted to the theme of controlling teaching in the context of PE is surprising because most PE teachers rely predominantly on more teacher centered approaches (Curtner-Smith, Hasty, & Kerr, 2001; Kulinna & Cothran, 2003; Mawer, 1999; Mosston & Ashworth, 1990, 2002; Penney & Evans, 1999). Although student-centered styles are gradually included in the teaching repertoire of physical educators (Byra & Jenkins, 2000), many teachers still make the maximum number of decisions (e.g., on learning content, pace, and rhythm) and allow only minimal involvement of the students in decisions. The PE teacher typically selects and demonstrates the exercises, after which commands, directions, and cues are provided to guide the students through the exercises. Such a teacher-centered communication style has been found to yield motor learning effects, but has also been found to relate to less enjoyment among students (Boyce, 1992; Hancock, Bray, & Nason, 2002). Although a teacher-centered climate does not necessarily involve that teachers interact with their students in a controlling manner, such an approach might increase the likelihood of teachers relying on controlling practices when compared to a more student-centered climate. Thus, it seemed important to examine the manifestations and outcomes of controlling teaching in greater detail in the context of PE. Specifically, the aim of the present

study was to examine the relevance of a distinction between two different faces of controlling teaching, that is, internally controlling and externally controlling teaching.

1.1 Internally and Externally Controlling Teaching Behavior

According to SDT, a controlling style can be expressed in at least two different ways, that is, in an internally controlling way and in an externally controlling way (Ryan, 1982; Soenens & Vansteenkiste, 2010). Internally controlling strategies are intended to get students to pressure themselves by appealing to their feelings of guilt, shame, anxiety, or self-worth. Externally controlling strategies are aimed at coercing and controlling students with external contingencies, such as directives, deadlines, incentives, and (threats of) punishments. Whereas externally controlling strategies are often relatively visible and overt (e.g., rewarding, yelling, using controlling language, like you 'should' or you 'must'), this will not necessarily be the case for internally controlling strategies. To illustrate, when a PE teacher obliges students to do push-ups because they are misbehaving (i.e., an externally controlling strategy), the contingency between students' behavior and the punishment is obvious. However, when students misbehave, a teacher can also punish in a more covert and subtle way, for instance, through the facial display of disappointment or through the withdrawal of attention. Still, internally controlling strategies can also be displayed in an open and overt way, for instance when the teacher verbally expresses his/her disappointment with the behavior of the students.

There has not been systematic empirical research into the conceptual distinction between internally and externally controlling teaching. Most studies on controlling teaching have either measured controlling teaching in an undifferentiated way (e.g., De Meyer et al., 2014) or have focused on one particular feature of controlling teaching (e.g., Soenens et al., 2012). There is relatively more research on internally (Assor, Roth, & Deci, 2004; Barber,

1996) or externally (e.g., Gershoff, 2013) controlling strategies in the literature on parenting. While internally controlling parenting has been found to be primarily predictive of internalizing problems in children such as depression and anxiety (Barber, 1996), externally controlling parental strategies (such as physical punishment and verbal hostility) are robust predictors of externalizing problems such as aggression and delinquency (e.g., Gershoff et al., 2012).

More recently there is growing interest in the dynamics of controlling strategies in sports (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011; Bartholomew, Ntoumanis, & Thogersen-Ntoumani, 2010) and in the educational context (Assor et al., 2005; De Meyer et al., 2014; Haerens et al., 2015; Vansteenkiste, Simons, et al., 2005). To the best of our knowledge, however, only a few studies investigated the specific role of internally and externally controlling teaching. Assor et al. (2005) showed that students' perceptions of externally controlling teaching strategies, such as not letting students work at their preferred pace, were associated with negative emotions and suboptimal forms of motivation. In a series of experimental studies, Vansteenkiste, Simons, et al. (2005) showed that, even subtle, implicit, and covert forms of pressure (i.e., internally controlling strategies) have a negative causal impact on early adolescents' task involvement and achievement. In one of the few studies directly comparing internally and externally controlling teaching instructions, Wijnia et al. (2014) found that both types of controlling practices undermined students' motivation and performance in problem-based learning to the same degree. Up until today, few studies have addressed the differential effects of internally and externally controlling teaching simultaneously. Hence, their differential associations with student outcomes remain to be examined, particularly in the context of PE. In this study we examined associations between both types of perceived controlling teaching and students' motives for PE.

1.2 Perceived Types of Controlling Teaching and Students' Motivation for PE

SDT conceptualizes motivation in terms of its quality, ranging from optimal motivation (i.e., intrinsic motivation and identified regulation), over introjected and external regulation, to a lack of motivation (amotivation) (Deci & Ryan, 2000). Intrinsic motivation occurs when students engage in an activity for the sake of the enjoyment and challenge experienced in the activity itself. Identified motivation refers to students' understanding and personal endorsement of the value of an activity. In both cases students experience a sense of volition and psychological freedom. In the case of introjected regulation, students act out of internal pressures, such as the avoidance of guilt, shame, or anxiety or attempts to bolster their self-worth. In the case of external regulation, students act because they feel pressured from the outside, such as by a desire to obtain rewards, to avoid punishments, or to meet external obligations. Although introjected and external regulation bring feelings of pressure and tension, they involve a certain goal-directedness and intentionality. This is not the case with amotivation, an orientation where people do not see any reason to act in a particular way. Amotivated students lack intentionality because they do not value the activity or because they do not feel able to do it (Deci & Ryan, 2000).

Student motivation is of major importance in PE, because it predicts important student outcomes (see Van den Berghe, Vansteenkiste, Cardon, Kirk, & Haerens, 2014 for an overview). Autonomous motivation is related positively to concentration (Standage, Duda, & Ntoumanis, 2005), effort (Ntoumanis, 2001), vitality (Mouratidis et al., 2011), objectively recorded physical activity (Aelterman et al., 2012), performance (Vansteenkiste, Simons, Soenens, et al., 2004), and leisure-time physical activity behavior (Cox, Smith, & Williams, 2008). In contrast, controlled motivation and amotivation are either unrelated to these

desirable outcomes or positively related to maladaptive student outcomes, such as boredom (Ntoumanis, 2001) and unhappiness (Standage, Duda, & Pensgaard, 2005).

According to SDT, the style used by teachers during interactions with students is one particular source of influence on students' quality of motivation (Reeve, 2009). While an autonomy-supportive teaching style is said to foster autonomous motivation, a controlling teaching style would elicit controlled motivation and amotivation. Several studies in the context of PE have confirmed these hypotheses (e.g., De Meyer et al., 2014; Haerens et al., 2015; Standage, Duda, & Ntoumanis, 2005). It has been argued that externally controlling socialization would be particularly predictive of amotivation and external regulation (Soenens & Vansteenkiste, 2010). Exposed to externally controlling teaching practices, students would feel pressured from without (external regulation) and may even develop a helpless orientation towards the learning activity (amotivation). In contrast, an internally controlling style would be particularly predictive of external regulation and introjection. Because internally controlling teaching initially still represents a source of pressure from the outside, it would elicit external regulation (much like externally controlling teaching). At the same time it would appeal to internally pressuring feelings in students' own functioning (e.g., guilt and self-worth concerns), thereby eliciting introjected motivation. Theoretically, internally controlling teaching would not necessarily lead to amotivation because it would lead to at least a partial (yet conflicted) internalization of the teacher's instructions and standards (Assor et al., 2004).

1.3 The Present Study

The overall aim of the present study was to obtain more fine-grained insight in different manifestations of controlling teaching in relation to students' motivation for PE. A first aim was to examine, using both expert ratings and factor analysis on student ratings of

perceived controlling teaching, whether internally and externally controlling teaching represent distinct dimensions. Second, we aimed to investigate whether internally and externally controlling teaching would relate differentially to students' quality of motivation for PE. We hypothesized that both internally and externally controlling teaching would be related negatively to autonomous forms of motivation (i.e., intrinsic motivation and identified regulation) and positively to external regulation. We also anticipated a number of differential associations. While externally controlling teaching would be related uniquely to amotivation, internally controlling teaching would be related uniquely to introjected regulation.

Third, as teachers can display unique combinations of (controlling) practices, we aimed to further examine the relevance of the distinction between internally and externally controlling teaching using a person-centered approach, that is, by means of a cluster analysis. Cluster analysis allows one to examine how perceptions of internally and externally controlling teaching co-occur within individual students. If the distinction between both types of controlling teaching is valid and relevant, we would find evidence not only for profiles characterized by similar levels of both types of control (e.g., students perceiving low levels of both types of controlling teaching and students perceiving high levels of both types of controlling teaching) but also for profiles characterized rather uniquely by one particular type of control (e.g., students perceiving elevated levels of externally controlling teaching but not internally controlling teaching or vice versa). Having identified different profiles of perceived controlling teaching, we also aimed to examine between-profile differences in students' motivation for PE. We generally expected that these between-profile differences would confirm the hypothesized differential associations between the two types of controlling teaching and the motives for PE.

2 Method

2.1 Participants

Participants were 925 students (57% were males) out of 92 classes in 5 different secondary schools in Flanders. A total of 19 different PE teachers taught PE to these students (ranging from 1 to 8 classes per PE teacher). Students were on average 15.80 years old (*SD* = 1.99 ranging from 12 to 21 years), with 43% following an academic track, 19% being enrolled in a technical track and 38% following a vocational track. The distribution of students across the school years was as follows: 7th-grade students (n = 69, 7%), 8th-grade students (n = 166, 18%), 9th-grade students (n = 158, 17%), 10th-grade students (n = 192, 21%), 11th-grade students (n = 173, 19%), 12th-grade students (n = 106, 11%), and 13th-grade students (n = 61, 7%).

2.2 Procedure

Data collection took place in school during a 50-minute academic class. Questionnaires were administered in paper-and-pencil format. Prior to the research, parents received a letter explaining the purpose of the study and were provided with the possibility not to let their child participate in the study (passive informed consent). The study protocol was approved by the Ethical Committee of Ghent University.

2.3 Measures

All items in the questionnaires were rated on a 5-point Likert scale ranging from 1 *(not at all true for me)* to 5 *(very true for me).*

Controlling teaching. To assess students' perceptions of controlling teaching, we developed a scale containing six items for internally controlling teaching and six items for externally controlling teaching. Items were based on the 7-item Psychologically Controlling

Teaching scale (PCT; Soenens et al., 2012) and a previously developed and validated observation instrument on controlling teaching (Van den Berghe et al., 2013). Information about the internal structure and psychometrics of this measure will be provided in the Results section.

Student motivation. Students' motivation toward PE was measured by means of the Behavioral Regulations in Physical Education Questionnaire (BRPEQ; Aelterman et al., 2012). This questionnaire has five subscales representing the motives proposed by SDT, each being assessed with four items. After an introduction in which it was explained that the questionnaire aimed at gaining insight into motives for participating in secondary school PE, students were presented 20 items representing intrinsic motivation and identified regulation (i.e. autonomous motivation), introjected and external regulation (i.e. controlled motivation), and amotivation. Internal consistencies were moderate to good with Cronbach's alphas of .92 for intrinsic motivation (4 items; e.g., 'I put effort in PE because PE is fun'), .86 for identified regulation (4 items; e.g., 'I put effort in PE because I value the benefits of PE'), .61 for introjected regulation (4 items; e.g., 'I put effort in PE because I would feel guilty if I didn't'), .66 for external regulation (4 items; e.g., 'I put effort in PE because others put me under pressure'), and .87, for amotivation (4 items; e.g., 'I think PE is a waste of time'). A confirmatory factor analysis using Mplus software (Muthén & Muthén, 2012) was used to test the structure of the 20 items from the BRPEQ. Estimation of a five-factor model yielded fit indices that approached criteria for adequate fit [χ^2 (160) = 494.10, p < .001, CFI = .95, RMSEA = .05, SRMR = .08].

2.4 Plan of Analysis

Aim 1: Expert ratings and factorial validity.

Expert rating. As a first way to validate the distinction between two types of controlling teaching, 15 experts in SDT judged the degree to which each of the 12 items for controlling teaching represented internally or externally controlling teaching behaviors. They first received a theoretical definition of the concepts of internally and externally controlling teaching (see the Appendix) and were then asked to rate the degree to which the 12 items fit the definition of both concepts on a scale ranging from 1 (*totally not agree*) to 5 (*totally agree*). In addition to these continuous ratings, the content coders were asked to categorize each item into one of three categories: internally controlling, externally controlling, or unclear (undecided).

Confirmatory factor analysis. A confirmatory factor analysis using Mplus software (Muthén & Muthén, 2012) was used to test the structure of the remaining items.

Descriptive statistics. Paired samples t-tests were used to investigate whether students perceived their teachers as more internally or more externally controlling. Furthermore, an independent samples t-test was conducted to explore differences between boys and girls in perceived internally controlling, externally controlling, and motivation. Finally, correlations between the variables of interest were computed.

Aim 2: Dimensional approach. Given the nested structure of the data, we relied on multilevel analyses to examine the relation between perceived controlling teaching (i.e., internally and externally controlling) and students' motivation. In our data the hierarchical structure was not fully known because we did not have data on the class membership and teachers of 157 students of one school. For those cases (i.e., students) where information about the class level was lacking (i.e., it was not known which class they were in) we kept the

class-level part of the model empty. The remaining 768 students were nested within 70 different classes and 19 different PE teachers from four different schools. Because it is ideal to have at least 30 units at each level (Hox, 2010) and because a three-level model did not yield a better fit than a two-level model for most of the outcome variables, the data were conceptualized as a two-level model with students at Level 1 and classes at Level 2. Student age and gender were included as covariates at Level 1 and educational track was included as a covariate at Level 2. All quantitative explanatory variables were grand mean centered before entered into the predictor models.

All multilevel analyses were performed with MLwiN, version 2.31. First, we estimated variance components models (Rasbash, Steele, Browne, & Goldstein, 2009) or intercept-only models (Hox, 2010) to determine how much of the variation in students' motivation was situated at the student versus class level. This was done by calculating intraclass correlation coefficients (ICCs). The intercept-only model served as a baseline (i.e., null model) to compare subsequent more complex models with. In a next step the three covariates (i.e., age, gender, and educational track) were included in the models. In the final step, both perceived internally and externally controlling teaching were entered simultaneously in the models as predictors of each of the student outcomes.

Aim 3: Person-centered approach.

Cluster analyses. To explore how students perceived the co-occurrence of internally and externally controlling teaching, cluster analyses were used to generate profiles of these teaching dimensions. The analysis required two steps, thereby using a combination of hierarchical and nonhierarchical clustering methods (Gore, 2000). In the first step, a hierarchical cluster analysis was carried out using Ward's method based on squared Euclidean distances. Univariate outliers (values of more than 3 SD above or below the mean)

and multivariate outliers (individuals with high Mahalanobis values) were removed. The appropriate number of clusters was selected on the basis of the amount of variance that was explained by the clusters and the stepsize criterion (Milligan & Cooper, 1985). In the second step, nonhierarchical k-means clustering was used to form the final groups. To examine stability of cluster solutions, the sample was randomly split into halves and the full two-step procedure (Ward, followed by k-means) was then applied to each half. The participants in each half of the sample were assigned to new clusters on the basis of their Euclidean distances to the cluster centers of the other half of the sample. These new clusters were then compared for agreement with the original cluster solution by means of Cohen's kappa (K). The two resulting kappas were averaged, and an agreement of at least 0.60 was considered acceptable (Asendorpf, Borkenau, Ostendorf, & Van Aken, 2001).

Relations between cluster membership and outcomes. To explore the external validity of the retained cluster solution, we investigated whether the identified profiles yielded different scores on students' motivation. To this, we performed multilevel regression analyses by adding cluster membership as a predictor for each of the types of motivation in separate models. For each outcome (i.e., type of motivation), the regression equation was repeated five times (for the five clusters) by changing the reference category from the cluster membership, to obtain the different cluster means of students' motivation.

3 Results

Aim 1: Expert Ratings and Factorial Validity

Expert ratings. Table 1 shows the findings of the expert evaluation. Most items were rated clearly as representing one of the two concepts and could be classified clearly into the categories representing externally or internally controlling teaching. Specifically, 11 items were classified as supposed by at least 80% of the coders. Only one of the items ('Acts

strictly when I disappoint him/her') was classified neither as internally controlling nor as externally controlling.

Confirmatory factor analysis. Initial estimation of a 2-factor model on the 11 remaining items yielded fit indices that approached criteria for adequate fit [χ^2 (43) = 216.67, p < .001, CFI = .90, RMSEA = .07, SRMR = .05]. Modification indices suggested removing two items. After removing these two additional items (i.e., 'My teacher is less friendly with me when I do not do the things his/her way' and 'My teacher punishes me'), a good model fit was established [χ^2 (26) = 94.77, p < .001, CFI = .95, RMSEA = .05, SRMR = .04], with four items representing internally controlling teaching and with five items representing externally controlling teaching. Internal consistencies for externally controlling and internally controlling teaching based on these nine remaining items (Cronbach's alpha were .78 and .71, respectively) were adequate[1].

Descriptive statistics. Correlations, descriptive statistics, and gender differences among the study variables are presented in Table 2. Students were found to perceive less internally controlling teaching (M = 1.43 ± .59) compared to externally controlling teaching (M = 2.09 ± .94; t(924) = -25.09; p <. 001). The observed scores for both internally controlling (ranging between 1 and 3.5) and externally controlling teaching (ranging between 1 and 5) were positively skewed. They showed skewness values of 1.56 and 0.79, respectively. Furthermore, both types of perceived controlling teaching were positively related to each other (r =.54, p < .001). Boys reported higher levels of internally controlling teaching than girls. Boys also reported more intrinsic motivation, more identified regulation, and less

[1] In addition to the CFA, a Principal Components Analysis (with promax rotation) was also performed. Two components had an eigenvalue > 1, explaining 54,47 % of the total variance. The final factorial structure was identical to the one obtained with CFA.

amotivation than girls. Students' age was related only to intrinsic motivation and amotivation.

Perceived internally and externally controlling teaching related negatively to autonomous motivation (i.e., intrinsic motivation and identified regulation) and positively to controlled motivation (i.e., introjected and external regulation) and amotivation. All relationships were significant and were in the expected direction. The associations were systematically stronger for perceived internally controlling (ranging between -.25 and .37) than for perceived externally controlling teaching (ranging between -.14 and .21).

Table 1

Expert Evaluation of Internally and Externally Controlling Items

	Internally Controlling	**Externally Controlling**	**Expert Assessment (number of experts)**		
Item	Mean (SD)	Mean (SD)	Internal controlling	External controlling	Undecided
Externally Controlling Teaching					
My PE teacher…					
Punishes me.	1.53 (.83)	4.47 (1.13)	0	14	1
Threatens to give bad grades when I do not cooperate.	1.40 (.63)	4.80 (.78)	0	15	/
Counts down aloud to make sure that I persist.	1.87 (.92)	4.13 (1.13)	2	13	/
Threatens with sanctions when I am not doing what (s)he tells me to do.	1.40 (.91)	4.73 (1.03)	0	15	/
Threatens that we will not do any fun activities when I do not cooperate.	1.67 (.82)	4.67 (.49)	1	14	/
Yells when I am not doing what (s)he wants me to do.	2.13 (.92)	3.47 (1.25)	3	12	/
Internally Controlling Teaching					
My PE teacher…					
Is less friendly with me when I do not do the things his/her way.	3.93 (1.39)	2.27 (1.22)	13	2	/
Pays less attention to me when I disappoint him/her.	4.13 (1.41)	2.00 (1.46)	13	2	/
Makes me feel guilty when I disappoint him/her.	4.87 (.35)	1.20 (.41)	15	0	/
Often shows that (s)he is disappointed in me.	4.93 (.26)	1.33 (.49)	15	0	/
Acts strictly when I disappoint him/her.	2.60 (.99)	3.67 (.90)	5	9	1
Shows that (s)he is personally hurt when I do not meet his/her expectations.	4.87 (.35)	1.33 (.62)	15	0	/

Table 2

Correlations, Means, and Standard Deviations for Study Variables

	Variables	1	2	3	4	5	6	7	*Total (n = 925)*	*Boys (n = 526)*	*Girls (n = 399)*	*t-value*
1	Internally controlling								1.43 (.59)	1.47 (.63)	1.37 (.51)	2.56*
2	Externally controlling	.54***							2.09 (.94)	2.11 (.98)	2.07 (.90)	.65
3	Intrinsic motivation	-.25***	-.14***						3.78 (1.12)	4.02 (1.04)	3.47 (1.12)	7.70**
4	Identified regulation	-.17***	-.12***	.69***					3.57 (1.11)	3.72 (1.08)	3.39 (1.12)	4.50**
5	Introjected regulation	.27***	.09**	.02	.17***				1.90 (.78)	1.94 (.79)	1.86 (.77)	1.60
6	External regulation	.37***	.17***	-.23***	-.11***	.51***			1.75 (.76)	1.79 (.79)	1.69 (.70)	1.87
7	Amotivation	.32***	.21***	-.71***	-.63***	.09***	.37***		1.79 (.99)	1.68 (.93)	1.92 (1.03)	-3.65**
8	Age	.01	.00	-.18***	-.06	-.06	.00	.10**	15.77 (1.98)	15.71 (2.02)	15.85 (1.92)	

Note. * $p < .05$, ** $p < .01$, ***$p < .001$

Aim 2: Dimensional approach

Regression analyses. We first estimated the ICCs in the baseline variance component models for perceived controlling teaching and students' motivation. These estimates indicated that there was significant between-class-level variance for perceived internally and externally controlling teaching, with ICCs of 14 % (χ^2 = 13.73, *df* = 1, *p* < .001), and 27 % (χ^2 = 21.20, *df* = 1, *p* < .001), respectively. Note that the class-level variance for internally controlling teaching was somewhat lower than the class-level variance for externally controlling teaching. Next, the ICCs in the baseline variance component models for students' types of motivation indicated that introjected regulation and intrinsic motivation yielded significant between-class variance, with an ICC of 10% (χ^2 = 9.548, *df* = 1, *p* = .002) and 5 % (χ^2 = 4.52, *df* = 1, *p* = .03), respectively. For amotivation, external regulation, and identified regulation, the ICCs were non-significant with values of 0 % (χ^2 = 0.00, *df* = 1, *p* = 1.00), 3 % (χ^2 = 2.64, *df* = 1, *p* = .10), 4 % (χ^2 = 2.74, *df* = 1, *p* = .10), respectively.

The results of the multilevel regression analyses are presented in Table 3. After including the three covariates (i.e., students' age, gender, and educational track) in Model 1, we added perceived internally and externally controlling teaching as predictors in the model (Model2). Internally controlling teaching related negatively to intrinsic motivation, identified regulation and related positively to introjected regulation, external regulation, and amotivation. Surprisingly, externally controlling was no longer related to any type of motivation when controlling for internally controlling teaching.

Table 3

Standardized Regression Coefficients of Internally and Externally Controlling in the Prediction of Student Motivation

	Intrinsic motivation			Identified regulation			Introjected regulation		
Parameter	Model 0	Model 1	Model 2	Model 0	Model 1	Model 2	Model 0	Model 1	Model 2
FIXED PART									
Intercept	3.91 (.05)	4.02 (.07)	4.02 (.07)	3.68 (.05)	3.89 (.08)	3.88 (.08)	1.91 (.04)	1.92 (.07)	1.92 (.06)
Students' age		-.06 (.02)**	-.06 (.02)**		-.01 (.02)	-.01 (.02)		-.02 (.02)	-.03 (.02)
Students' gender (girl)[a]		-.37 (.08)***	-.40 (.08)***		-.32 (.09)***	-.33 (.09)***		-.02 (.07)	.01 (.07)
Technical track		-.05 (.11)	-.03 (.10)		-.28 (.13)	-.27 (.12)		-.17 (.10)	-.18 (.10)
Vocational track		.17 (.07)	.22 (.09)		-.08 (.08)	-.05 (.11)		.12 (.10)	.09 (.09)
Internally controlling			-.51 (.07)***			-.30 (.08)***			.45 (.05)***
Externally controlling			.11 (.04)			.06 (.05)			-.04 (.04)
RANDOM PART									
Class level variance	.05 (.03)	.01 (.02)	.00 (.00)	.04 (.02)	.04 (.03)	.03 (.02)	.06 (.02)	.05 (.02)	.04 (.02)
Student level variance	1.00 (.05)	.99 (.05)	.93 (.05)	1.10 (.06)	1.09 (.06)	1.07 (.06)	.56 (.03)	.56 (.03)	.51 (.03)
Deviance test model	2165.416	2071.336	2020.634	2226.384	2159.604	2144.120	1741.102	1689.792	1614.110
χ2(df)		94.08 (4) ***	50.70 (2) ***		66.78 (4) ***	15.48 (2) ***		51.31 (4) ***	75.68 (2) ***

Note. Standard deviations are presented in parentheses. All *p* values have been adjusted by Bonferonni corrections (α = .05/5).

** $p < .01$; *** $p < .001$

Table 3 (continued)

	External regulation			Amotivation		
Parameter	Model 0	Model 1	Model 2	Model 0	Model 1	Model 2
FIXED PART						
Intercept	1.73 (.03)	1.69 (.06)	1.70 (.05)	1.65 (.03)	1.59 (.06)	159 (.06)
Students' age		-.01 (.02)	-.01 (.01)		.01 (.02)	.00 (.02)
Students' gender (girl)[a]		-.05 (.06)	-.02 (.06)		.13 (.07)	.17 (.07)**
Technical track		.03 (.08)	.01 (.07)		.03 (.09)	.01 (.08)
Vocational track		.16 (.07)	.12 (.07)		.01 (.06)	-.02 (.08)
Internally controlling			.50 (.05)***			.50 (.06)***
Externally controlling			-.03 (.03)			-.02 (.04)
RANDOM PART						
Class level variance	.02 (.01)	.01 (.01)	.00 (.01)	.00 (.00)	.00 (.00)	.00 (.00)
Student level variance	.53 (.03)	.53 (.03)	.46 (.03)	.74 (.04)	.73 (.04)	.65 (.03)
Deviance test model	1679.762	1623.562	1514.206	1902.985	1844.983	1760.888
$\chi 2$(df)		56.20 (4) ***	109.36 (2) ***		58.00 (4) ***	84.10 (2) ***

Note. Standard deviations are presented in parentheses. All *p* values have been adjusted by Bonferonni corrections ($\alpha = .05/5$).
** $p < .01$; *** $p < .001$

Aim 3: Person-Centered Approach

Cluster analyses. Prior to conducting cluster analyses, we removed 26 univariate outliers and 30 multivariate outliers. This resulted in a total sample of 869 participants. The number of clusters was selected on the basis of a number of criteria. First, we looked at how much variance the clusters explain in internally and externally controlling teaching, using as a criterion that at least 50% of the variance needs to be explained (Milligan & Cooper, 1985). This criterion was met from the three-cluster solution onwards. We then checked how much additional variance was explained when retaining more clusters. The four-cluster solution clearly explained additional variance (74% for internally and 74% for externally controlling teaching) compared to the three-cluster solution (61% for internally and 69% for externally controlling teaching). The five-cluster solution also explained a substantial amount of additional variance (77% for internally and 82% for externally controlling teaching) compared to the four-cluster solution (74% for internally and 74% for externally controlling teaching). A six-cluster solution (which explained 80% of the variance in internally controlling and 85% of the variance in externally controlling) no longer explained a substantial amount of additional variance (< 5%) and seemed theoretically less interpretable and less parsimonious than the five cluster solution. A second criterion that is commonly used to select the optimal number of clusters is the stepsize criterion. This rather simple criterion involves examining the differences in fusion values between hierarchy levels. A large difference would suggest that the data were overclustered in the last merger (Milligan & Cooper, 1985). Thus, the maximum difference is taken as indicating the optimal number of clusters in the data. The differences in fusion values indicated that the transition from four to five clusters was the last transition with a substantial difference in fusion values,

suggesting that the five-cluster solution is indeed to be preferred. The stability of the five-cluster solution had a kappa value of .80, indicating good stability (Landis & Koch, 1977).

Both the standardized and absolute scores for internally and externally controlling teaching within each of the five profiles are presented in Table 4 (top part). All groups differed significantly from each other on internally and externally controlling. The cluster labels were given based on the z-scores, which reflect relative differences between individuals in the sample.

Specifically, the clusters represented (1) a low internally controlling cluster (*n* = 224, 26%), with relatively low scores on internally controlling and average scores on externally controlling; (2) a low controlling cluster (*n* = 352, 40 %), with relatively low scores on both internally and externally controlling; (3) a predominantly externally controlling cluster (*n* = 110, 13%), with high scores on externally controlling and average scores for internally controlling teaching; (4) a predominantly internally controlling cluster (*n* = 103, 12%), with only high scores on internally controlling teaching; and (5) a highly controlling cluster (*n* = 80, 9%), with both dimensions scoring relatively high. Figure 1 shows the final cluster solution, with the Y-axis representing the standardized scores.

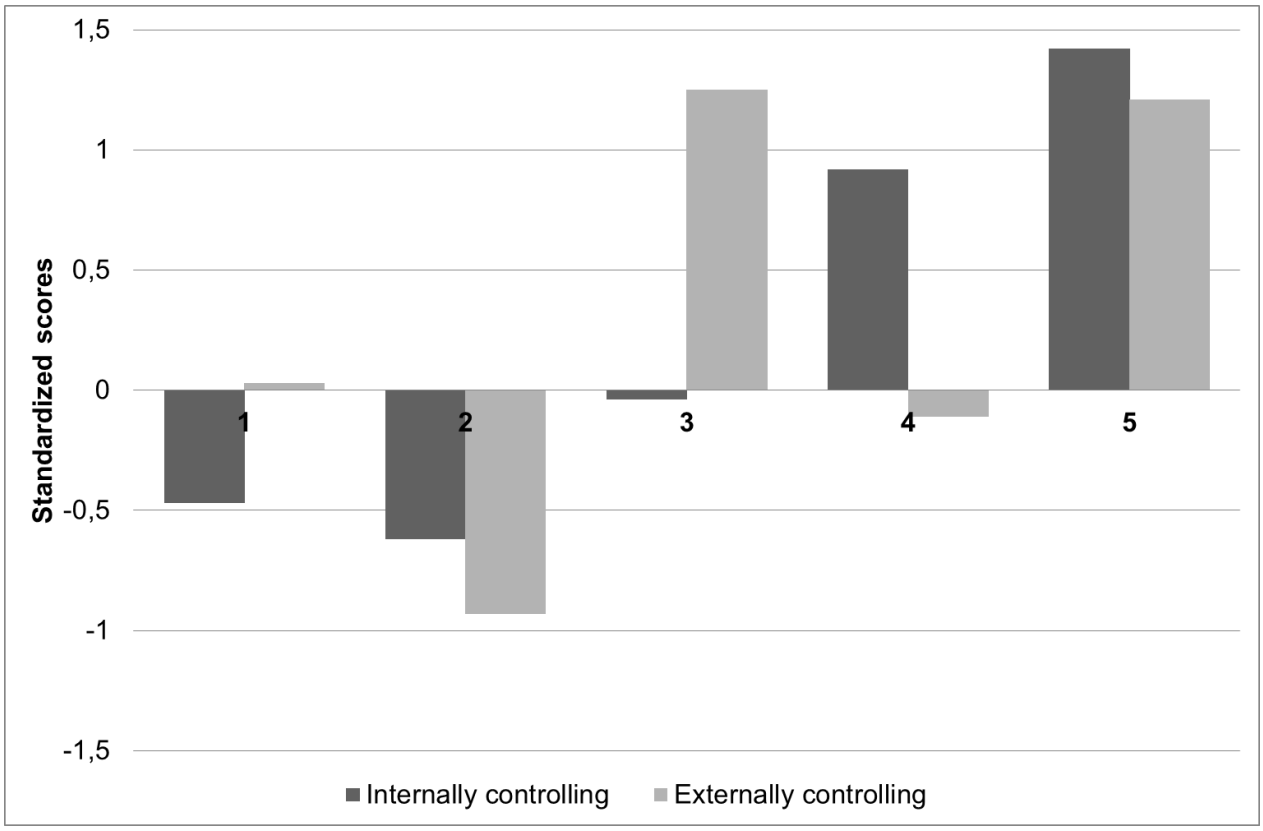

Figure 1. Cluster Solution Based on Scores for Internally and Externally Controlling Teaching

Relations between cluster membership and outcomes. Table 4 shows pairwise comparisons between the clusters in terms of motivation conducted by means of multilevel regression analyses. Students reporting relatively low levels of controlling teaching (Cluster 2) and students in the predominantly externally controlling group (Cluster 3) reported the highest levels of intrinsic motivation. More specifically, students in the predominantly externally controlling group (Cluster 3) were more intrinsically motivated when compared to all other groups, except when compared to the low controlling cluster (Cluster 2). With regard to identified regulation, none of the groups differed from each other significantly.

With regard to introjected regulation, students in the predominantly internally controlling cluster (Cluster 4) and the high controlling cluster (Cluster 5) reported the highest levels. The low internally controlling group (Cluster 1) and the low controlling group (Cluster

2) reported the lowest level of introjected regulation. A similar pattern was found for external regulation, with the predominantly internally controlling cluster (Cluster 4) and the highly controlling cluster (Cluster 5) reporting the highest levels of external regulation. Students in the low controlling group (Cluster 2) reported the lowest level of external regulation. The highest levels of amotivation were reported by the students in the highly controlling cluster (Cluster 5), which significantly differed from all other clusters but not from the predominantly internally controlling cluster (Cluster 4).

Table 4

Mean Scores and Cluster Comparison for five Clusters (N = 869)

Variables	Cluster 1: low internally controlling group	Cluster 2: low controlling group	Cluster 3: predominantly externally controlling group	Cluster 4: predominantly internally controlling group	Cluster 5: high controlling group
Cluster dimensions (z-scores)					
Internally controlling	-.40 (.04)a	-.61 (.04)b	.06 (.06)c	1.42 (.05)d	1.99 (.06)e
Externally controlling	.17 (.04)a	-.91 (.03)b	1.59 (.05)c	-.05 (.05)d	1.44 (.06)e
Cluster dimensions (raw scores)					
Internally controlling	1.17 (.02)a	1.07 (.09)b	1.37 (.03)c	2.00 (.02)d	2.25 (.03)e
Externally controlling	2.13 (.03)a	1.22 (.03)b	3.32 (.04)c	1.95 (.04)d	3.20 (.05)e
Student outcomes					
Intrinsic motivation	4.00 (.09)ab	4.17 (.08)a	4.27 (.13)a	3.62 (.12)c	3.69 (.14)bc
Identified regulation	3.90 (.11)a	3.91 (.10)a	4.03 (.14)a	3.72 (.13)a	3.69 (.16)a
Introjected regulation	1.75 (.08)ab	1.72 (.07)a	2.00 (.10)bc	2.31 (.10)d	2.26 (.11)cd
External regulation	1.61 (.07)ab	1.48 (.06)b	1.72 (.09)a	2.13 (.08)c	2.10 (.10)c
Amotivation	1.53 (.08)a	1.42 (.07)a	1.47 (.10)a	1.88 (.10)b	2.02 (.12)b

Notes. Values in parentheses are standard errors. A cluster mean is significantly different from another mean if they have different superscript letters. For the cluster dimensions, p values were evaluated at .05-level. The p values for student motivation have been adjusted by Bonferonni corrections ($\alpha = .05/5$). Differences between five clusters were tested by repeating the equations several times and changing the reference category

4 Discussion

Up until today, few studies on PE teachers' way of interacting with the students focused on controlling teaching as such, that is, without considering it simply as the opposite of autonomy support. Recent theorizing within SDT (Vansteenkiste & Ryan, 2013), however, suggests that it is important to study controlling teaching in its own right. In addition, empirical work revealed separate and unique effects of controlling teaching in relation to important student outcomes, including negative emotions (Assor et al., 2005), oppositional defiance (Haerens et al., 2015), low quality motivation (De Meyer et al., 2014), and low task involvement and achievement (Vansteenkiste, Simons, et al., 2005). However, in previous studies, controlling teaching was measured either in an undifferentiated way (not clearly distinguishing between internally and externally controlling strategies), or focusing on one of both features of controlling teaching.

This study provided evidence that controlling teaching has different faces. Specifically, we provided three types of evidence for the relevance of the distinction between internally and externally controlling teaching. First, the large majority of content coders agreed on the assignment of 11 of the 12 controlling items to either the internally or the externally controlling category. Second, also on the basis of a factor analysis internally and externally controlling teaching were clearly distinguished. Finally, making use of cluster analyses, we found evidence not only for profiles characterized by similar levels of both types of controlling teaching but also for profiles characterized rather uniquely by one particular type of controlling, which means that internally and externally controlling teaching can occur separately.

A comparison of the mean levels of both types of controlling teaching showed that, when teachers pressure students, they rely predominantly on overt and observable tactics,

such as threats and punishments for not fulfilling teachers' expectations. A possible explanation for the relatively high occurrence of externally controlling strategies might be that a teacher-centered approach is widely prevalent among PE teachers (Curtner-Smith et al., 2001; Kulinna & Cothran, 2003; Mawer, 1999; Mosston & Ashworth, 1990, 2002; Penney & Evans, 1999). Such a teacher-centered approach involves a commanding and directive style, which sometimes may be experienced as externally controlling by students. While teachers were perceived to engage relatively more frequently in externally controlling strategies, it seems that they make little use of internally controlling strategies. A possible reason might be that the use of internally controlling depends relatively less on contextual factors (e.g., lesson goals and content, safety issues, etc.), but instead is more related to personal characteristics of the teachers. For instance, while shouting and yelling may be elicited by situational features such as safety hazards, the inclination to induce guilt and to display disappointment might be intertwined more closely with a teacher's personality functioning. Beausaert, Sierens, Soenens, and Dochy (2009), for instance, demonstrated that the use of an internally controlling teaching style was predicted by teachers' self-critical perfectionism.

Although internally and externally controlling strategies were quite strongly positively associated with each other, the relationship between controlling teaching and students' motivation was driven mainly by internally controlling aspects of teaching. The findings with regard to internally controlling teaching are in line with the findings previously reported in the parenting domain, where internally controlling strategies such as contingent regard provided by the parents were also associated with higher levels of introjected regulation (Assor et al., 2004). We extended these findings to the physical educational domain and provided evidence that students' perceptions of internally controlling teaching were related

not only to higher levels of introjected regulation, but also to higher levels of external regulation and lower levels of identified regulation and intrinsic motivation. In other words, even when students perceive their teachers as making use of sometimes covert forms of controlling strategies, they will be more likely to act for controlling reasons (e.g., avoiding punishments or feeling of shame) or will lack intentionality to engage (i.e., amotivation) instead of engaging out of interest or because they see the utility of the activity. Remarkably, these associations were obtained even though the occurrence of internally controlling teaching behavior was quite low. Such low levels of controlling socialization are quite common in research on teaching (De Meyer et al., 2014; Haerens et al., 2015) and parenting (Barber, 1996). In spite of the low prevalence of a controlling socialization style, it robustly related with maladaptive outcomes (e.g., Barber, 1996; Roth, Assor, Niemiec, Ryan, & Deci, 2009). These findings are consistent with a general principle in social psychology, referred to by Baumeister, Bratslavsky, Finkenauer, and Vohs (2001) as the phenomenon that 'bad is stronger than good'. Because bad events, including need-thwarting and controlling teaching, are typically very salient when they occur, even a sporadic exposure to controlling teaching may provoke detrimental effects (Kins, Soenens, & Beyers, 2012). Externally controlling teaching was related in the same way to the motivational outcomes at the level of zero-order correlations, but did no longer predict any of the motivational outcomes when we controlled for students' perceptions of internally controlling teaching. Similarly, in the person-centered analyses, we found that associations between perceived teaching profiles and the motivational outcomes were driven mainly by internally controlling teaching and to a lesser extent by externally controlling teaching. Another unexpected result was that students in the predominantly externally controlling cluster even reported the highest levels of intrinsic motivation.

Herein we forward some possible explanations for these unexpected results. First, internally controlling teaching (relative to externally controlling teaching) was reported less commonly and might therefore be less normative in PE, which might explain why it is more detrimental to students' motivation. Gershoff et al. (2010) indeed demonstrated that some discipline techniques (e.g., corporal punishment, yelling) are less strongly associated with maladaptive outcomes when these techniques were perceived as normative by children. Second, compared to internally controlling strategies externally controlling strategies such as yelling or counting down (e.g., 'You have five seconds to be back, five, four, three, etc.') may be provided more often towards the class as a whole and not to a single student. Internally controlling strategies such as paying less attention or being less friendly are perhaps more commonly directed towards individual students, such that these strategies have a stronger impact on students' motivation, because students feel personally rejected or disapproved by the teacher. Third, students may interpret externally controlling strategies in a relatively more benign manner. Some students may even feel that teachers relying on externally controlling strategies, at least in the absence of internally controlling strategies, are more involved because they put a lot of energy into the lesson and are committed to the students and their learning process. To illustrate, some students might perceive a punishment in case of lack of student cooperation, as an effort of the teacher to keep the coherence and focus of the group. It could also be that students sometimes find these strategies warranted for instance when the teachers aims to encourage performance (e.g., synchronic dancing) or when security issues are at stake (e.g., children learning to swim). In some cases, for instance with the acquisition of basic skills, there is evidence that a teacher-centered approach (which can involve externally controlling practices) is superior to a student-centered approach (Graham & Heimerer, 1981). In those particular circumstances, some of the

externally controlling strategies such as yelling (e.g., 'You are slowing down, you need to speed up! Come on, keep going!') may even be interpreted as stimulating and encouraging rather than as need frustrating. The same externally controlling strategies (e.g., yelling) could then be perceived somewhat differently in other contexts, for instance in an academic class.

Together, these explanations for the lack of associations between externally controlling teaching with motivational problems (after taking into account internally controlling teaching) point to an important role for students' appraisal and interpretation of teachers' controlling practices (Soenens, Vansteenkiste, & Van Petegem, 2015). An important goal for future research is to examine (a) when actual teachers' behavior is perceived as being (externally and/or internally) controlling and (b) how students interpret both types of perceived controlling teaching (e.g., in terms of normativeness, legitimacy, and experiences of need satisfaction and need frustration). Students' personal characteristics (e.g., personality and past motivational experiences) are likely to play a role in these processes that give meaning to teachers' behavior. Given that in our study the individual-level variance was more pronounced in internally compared to externally controlling teaching, it seems likely that personal characteristics play a particularly prominent role in students' perception of internally controlling teaching strategies. Such research can help us to obtain a better understanding of the gap between students' perceptions of a teachers' behavior, and actual teaching behavior. It can also highlight students' active role in constructing perceptions of teaching behavior and dealing with need-thwarting events in particular.

4.1 Limitations and Directions for Future Research

A limitation of the present study was the cross-sectional design, which prevented us from drawing conclusions about direction of effects, let alone causality. The direction of the relationships warrants further investigation through longitudinal studies.

Moreover, students' perceptions of teaching behavior might be colored by their motivation or it might be that students' motivation influences teachers' behavior rather than vice versa. In that respect, future research would do well to include an assessment of actual teaching behavior by external observers or reported by the teachers themselves.

In future research it would also be interesting to investigate underlying mechanisms that explain the differential relationships between externally and internally controlling teaching and students' motivation. The inclusion of an assessment of need frustration and need satisfaction would provide such an opportunity. While previous research showed that perceived controlling teaching relates to maladaptive motivational outcomes particularly because students experience more need frustration (Haerens et al, 2015), no distinction has been made between externally and internally controlling teaching. With internally controlling teaching, there is a clear message that the teacher rejects the student. This is less the case with externally controlling teaching which, for instance, refers to the teacher punishing a student when not cooperating. If externally and internally controlling teaching differentially relate to need frustration, this might also explain some of the differences found in the current study. In that respect, it might also be interesting to let students evaluate the controlling items in terms of how controlling they are experienced. Such an assessment would provide better insight in how students perceive externally and internally controlling behaviors.

It would also be interesting to investigate what drives teachers to engage in some of the identified internally controlling strategies and whether this also depends on their own characteristics (e.g., maladaptive perfectionism) and contextual factors (e.g., student motivation, accommodation, learning goals, subject matter). Finally, future research would do well to include a measure of teachers' provision of structure. It might be interesting to try to differentiate some of the included controlling strategies from teachers' provision of structure because some strategies such as counting down might be interpreted by the students as the teachers adequately leading the learning process (Soenens et al., 2015).

4.2 Practical implications

From an applied perspective, it seems important for teachers to avoid using controlling strategies. Our results provided evidence that especially those strategies that are sometimes difficult to observe (e.g., showing feelings of disappointment through facial expressions) because they are expressed in a subtle and covert way, are related to less optimal forms of motivation. Although externally controlling teaching seems to have relatively less detrimental effects on students' motivation, we suggest teachers also to refrain from these strategies because both types of controlling teaching were quite strongly interrelated, because externally controlling strategies were related to suboptimal motivational outcomes at the level of zero-order correlations, and because studies in other domains have shown the detrimental effects of these strategies (Assor et al., 2005; Gershoff, 2013; Gershoff et al., 2012).

Current evidence-based continuous professional development programs are focusing mostly on how teachers can engage and motivate students during their lessons through becoming more autonomy supportive (e.g., Aelterman et al., 2013). The results of the

current study suggest that it is equally important to increase teachers' insight in the detrimental effects of controlling teaching.

4.3 Conclusion

This study provided some empirical evidence for the conceptual distinction between internally and externally controlling teaching in the context of PE. Because both types of controlling teaching did not display the anticipated differential pattern of associations with motivational outcomes, there is clearly a need for further research into the undoubtedly complex processes involved in teachers' application of these teaching practices and in the way they are appraised by students. Such research is important not only from a theoretical perspective but also for practice because controlling teaching is detrimental for students' motivation for PE and possibly also for their lifelong engagement in physical activity.

5 Summary

The current study investigated two different faces of controlling teaching in relation to students' motivation within the context of PE. We found evidence for a distinction between internally and externally controlling teaching strategies. When using externally controlling strategies, teachers typically try to pressure students from outside by shouting, punishing, or commanding. Internally controlling teaching might be more difficult to observe. It involves pressuring students in a more subtle way by inducing feelings of guilt and shame, by providing conditional regard, and by showing disappointment when expectations are not met. Both types of controlling teaching were related to maladaptive motivational outcomes in students, with internally controlling yielding the most adverse effects. Students reported teachers to use more externally controlling strategies relative to internally controlling strategies. It can be advised to teachers to refrain from using controlling strategies.

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Appendix

Theoretical Definition of the Concepts of Internally and Externally Controlling Teaching

Definition of internally controlling teaching:

Internally controlling teaching is characteristic of teachers who want to pressure students by appealing to students' self-worth. Their aim is to let students pressure themselves from within. The finality of this style is that students feel obliged from the inside to participate in an activity, for example to avoid feelings of guilt, shame, inferiority, and disappointment or to prove their worth to themselves or to the teacher. The strategies are sometimes subtle and difficult to observe directly because, for example, they are shown in a non-verbal way.

Definition of externally controlling teaching:

Externally controlling teaching is characteristic of teachers who want to pressure students explicitly and from the outside, that is, using strategies external to the individual. The finality of this style is that students feel obliged from the outside to participate in an activity: there are external contingencies that either need to be avoided (punishment and negative consequences) or achieved (deadlines, privileges, and rewards). The strategies used are usually clearly visible to others. If students do not meet the expectations of the teacher, clear tangible consequences will follow.

CHAPTER 4

DO STUDENTS WITH DIFFERENT MOTIVES FOR PHYSICAL EDUCATION RESPOND DIFFERENTLY TO AUTONOMY-SUPPORTIVE AND CONTROLLING TEACHING?

De Meyer, J., Soenens, B., Vansteenkiste, M., Aelterman, N., Van Petegem, S., & Haerens, L.

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Objectives: This study examined whether the effects of autonomy-supportive and controlling teaching in physical education depend on students' motivation.

Design: A preliminary, cross-sectional study relied on questionnaires administered to teachers. The main study involved an experimental design with students.

Methods: In the preliminary study, 95 teachers reported on their beliefs regarding the effectiveness of autonomy-supportive and controlling teaching styles for students with different motivational profiles. In the main study, 320 students completed a questionnaire on motivation and were then randomly assigned to an experimental condition in which they watched video-based vignettes of either an autonomy-supportive or a controlling style. After the experimental induction, students completed questionnaires on need satisfaction, need frustration, engagement, and oppositional defiance.

Results: Teachers tend to believe that autonomy support and control work best for students scoring high on, respectively, autonomous and controlled motivation. The main study, however, showed that the moderating role of student motivation in the effect of teaching style was limited. The few interactions obtained suggested that even students with poor quality motivation report that they would benefit from an autonomy-supportive approach and suffer from a controlling approach. Students in the autonomy-supportive, relative to the controlling, condition reported more engagement and less oppositional defiance, effects that were mediated by need satisfaction and frustration.

Conclusions: All students, independent of their motivational regulations when entering the experiment, reported that they would be more engaged and would show less oppositional defiance when they would interact with an autonomy-supportive instead of a controlling teacher during PE.

Keywords: self-determination theory, oppositional defiance, engagement, motivation, need satisfaction, need frustration

1 Introduction

"Unmotivated students are a real problem. As a teacher, you need to pressure them constantly, because if you don't, they will either do nothing or they will disturb the lesson. Providing choice and explaining the purpose of the lesson only works with motivated students. With unmotivated students there is only one way to go, and that is being controlling." (Peter, teacher)

Statements like these are characteristic of teachers who believe that students with a lack of motivation or poor quality motivation are better off when being pressured by teachers. They also suggest that autonomy support would only be beneficial for already optimally motivated students. This anecdotal statement raises the question whether teachers need to match their teaching style to students' motivation or whether an autonomy-supportive style is universally effective to promote engagement. Grounded in Self-Determination Theory (SDT; Ryan & Deci, 2000), the main goal of this research was to examine whether students' type of motivation alters the effectiveness of an autonomy-supportive (relative to a controlling) teaching style in the context of physical education (PE).

1.1 Type of Student Motivation for PE

Student' intensity and type of motivation has been found to predict key student outcomes in PE such as engagement, physical activity, and persistence (Ntoumanis & Standage, 2009). SDT conceptualizes motivation in terms of a continuum of increasing autonomy ranging from a lack of motivation (amotivation), over controlled to autonomous motivation (Deci & Ryan, 2000). When students are amotivated, they lack a sense of goal-directedness and intentionality. They display low motivation to engage in the required activity because they do not value the goal served by the behaviour, because they believe

the behaviour is not instrumental to reach the goal, or because they lack the competence to perform the activity (Ryan, Lynch, Vansteenkiste, & Deci, 2011).

Yet, even when students put effort in the required activity, their reasons for doing so can differ. In the case of controlled motivation, activity engagement is driven by external pressures, including the promise of good grades or the threat of punishments, or by internal pressures, such as guilt, shame, anxiety or self-worth contingencies. In contrast, autonomous motivation entails more volitional reasons for putting effort into the lesson, either because students understand and endorse the value of an activity or because they find the activity to be truly enjoyable and challenging (Deci & Ryan, 2000).

Students' type of motivation is essential for their engagement, performance, and adjustment (Ryan & Connell, 1989). Research in the context of PE has shown that autonomous motivation contributes positively to concentration (Standage, Duda, & Ntoumanis, 2005), vitality (Mouratidis et al., 2011), objectively recorded physical activity (Aelterman et al., 2012), and performance (Vansteenkiste, Simons, Soenens, et al., 2004). In contrast, controlled motivation is either unrelated or negatively related to desirable outcomes (Aelterman et al., 2012; Standage, Duda, & Ntoumanis, 2005) and positively related to maladaptive outcomes, such as poor coping (Ryan & Connell, 1989).

1.2 Autonomy-supportive and Controlling Teaching

SDT specifies teachers' interaction style as an important contextual factor influencing students' motivation. Particular attention has been paid to the degree to which teachers interact with their students in an autonomy-supportive (relative to a controlling) way (Reeve, 2009). Autonomy-supportive teachers adopt the students' perspective, highlight the relevance of learning activities, offer meaningful choices, and encourage initiative taking. Controlling teachers impose their own frame of reference, thereby pressuring students to

think, feel, or behave in particular ways, for instance, through the use of threats of sanction, controlling language, and guilt-induction. Correlational and experimental studies found autonomy-supportive teaching to be associated with autonomous motivation, engagement and higher grades, while controlling teaching behaviour was found to be related to amotivation and controlled motivation, disengagement, and resentment vis-à-vis the teacher (see Ntoumanis & Standage, 2009; Reeve, 2009 for overviews).

Herein, we examined the impact of an autonomy-supportive and controlling style on student engagement and oppositional defiance, two outcomes that received relatively little attention in prior experimental work. Engagement reflects students' behavioural, emotional, and cognitive involvement. It is a malleable construct which has been studied extensively (see Christenson, Reschly, & Wylie, 2012) and which yields manifold desirable outcomes, such as better learning, higher grades, and less drop-out (Skinner, Kindermann, Connell, & Wellborn, 2009b; Skinner, Wellborn, & Connell, 1990). In addition, engagement is considered an observable indicator of students' underlying motivation in school in general (Reeve et al., 2004; Skinner & Belmont, 1993) and in physical education in particular (Ferrer-Caja & Weiss, 2000; Ntoumanis, 2001). In spite of its presumed importance, engagement and its relation with underlying motivational processes has primarily received attention in correlational studies, but far less in experimental research. These correlational studies have shown that perceived autonomy-supportive teaching is related to engagement, both within and across time (e.g., Reeve, 2013).

Whereas autonomy-supportive teaching may be primarily conducive to positive outcomes, controlling teaching may elicit more negative outcomes, including oppositional defiance (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011; Vansteenkiste & Ryan, 2013). Oppositional defiance has been defined as a blunt rejection of the request of an authority

figure, as reflected in a tendency to do the opposite of what is expected. It is conceived as a defensive, compensatory way of coping with a controlling environment (Skinner et al., 2003; Vansteenkiste & Ryan, 2013). Research in the parenting context indicates that adolescents' oppositional defiance vis-à-vis their parents is related to externalizing and internalizing behavioural problems (Van Petegem, Soenens, Vansteenkiste, & Beyers, 2015). Similarly, in the context of PE, oppositional defiance as experienced during a single lesson was found to relate positively to feelings of resentment vis-à-vis the content of the lesson and the teacher (Aelterman et al., in revision). In addition, a few studies in the parental and educational context demonstrated that a controlling way of interacting with students is related to higher levels of oppositional defiance. Vansteenkiste, Soenens, Van Petegem, and Duriez (2014) found that a controlling parental style of introducing a prohibition predicted increasing levels of oppositional defiance in adolescents. Similarly, in the PE context perceived controlling teaching was found to relate to more oppositional defiance in students (Haerens et al., 2015).

On the basis of this research we expected that an experimental induction of autonomy-supportive (relative to controlling) teaching would result in higher levels of student engagement and lower levels of oppositional defiance.

1.3 Need Satisfaction and Need Frustration as Underlying Processes

According to SDT, the effects of autonomy-supportive and controlling teaching on students' outcomes can be explained through processes of need satisfaction and need frustration. SDT specifies three psychological needs that are considered inherent, universal, and essential for individuals' psychological growth and well-being (Deci & Ryan, 2000). Specifically, while the satisfaction of the needs for autonomy (i.e., experiencing a sense of volition), competence (i.e., experiencing a sense of effectiveness), and relatedness (i.e.,

experiencing a sense of closeness) is said to promote optimal functioning, the frustration of the needs for autonomy (i.e., experiencing a sense of pressure), competence (i.e., experiencing a sense of inadequacy), and relatedness (i.e., experiencing interpersonal alienation) would predict maladjustment and even psychopathology (Vansteenkiste & Ryan, 2013).

The distinction between need satisfaction and need frustration is critical because the absence of need satisfaction does not by definition constitute the presence of need frustration (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Vansteenkiste & Ryan, 2013). To illustrate, when students experience little volition when engaging in an activity (low autonomy satisfaction), this does not necessarily imply that they feel forced to do things against their will (autonomy frustration). As such, experiences of need frustration would be relatively distinct from experiences of low need satisfaction. Also, both processes would have somewhat differential antecedents and outcomes. Specifically, while autonomy-supportive behaviours would be primarily beneficial for experiencing need satisfaction and be conducive to optimal outcomes (i.e., need satisfaction; engagement), controlling behaviours would be specifically predictive of experiences of need frustration and relate to maladaptive outcomes (i.e., need frustration; defiance) (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011; Haerens et al., 2015; Vansteenkiste & Ryan, 2013).

1.4 Motivation as a Potential Moderator of Teaching Behaviour

Consistent with the critical role of autonomy-supportive and controlling teaching in the prediction of motivation, most studies have modelled students' motivation as either an outcome of teaching behaviour or as a mediator in the relation between teaching behaviour and student outcomes. However, students' motivation could also play a different role. That is, students' motivation may alter the effect of teaching behaviour, an idea that is consistent

with the general notion that children are pro-active agents in the socialization process rather than just passive recipients of socialization figures' behaviour (Reeve, 2013).

One way in which the pro-active role of students' motivation can manifest is by affecting students' responsiveness to teachers' behaviour. Specifically, depending on their intensity and type of motivation, students may differ in the degree to which they benefit from autonomy-supportive teaching and suffer from controlling teaching. Although this is an intriguing possibility, research examining this issue is scarce, with the few studies available yielding somewhat conflicting findings. Black and Deci (2000) found evidence for an interaction effect, such that only students with relatively low autonomous motivation (but not those with high autonomous motivation) performed better if they perceived their teachers as more autonomy-supportive. In contrast, Mouratidis et al. (2011) demonstrated that students with high autonomous motivation, as compared to those with low autonomous motivation, benefited somewhat more from an experimentally induced need-supportive PE lesson in terms of enjoyment and vitality. Given these discrepancies and the paucity of studies on the potentially moderating role of student motivation, more work is needed in this area. We suggest a number of different hypotheses regarding the potential role of student motivation.

As illustrated by the anecdotal quote above, one possibility is that only students high on autonomous motivation would benefit from autonomy support and that students high on amotivation or on controlled motivation would thrive most when exposed to a controlling teacher. Such a *match perspective* is inconsistent with SDT because autonomy-supportive and controlling teaching styles are expected to contribute, respectively, to greater need satisfaction and need frustration and because these experiences are considered universal determinants of students' adjustment (Deci & Ryan, 2000).

Still, it is possible that there may be variation in the extent to which autonomy-supportive and controlling styles affect students' needs, engagement, and oppositional defiance (Soenens et al., 2015). Among other factors, this variation may depend upon students' motivation. Specifically, the *sensitization perspective* on psychological needs (Moller, Deci, & Elliot, 2010) suggests that individuals with a history of need satisfaction are more sensitive to new opportunities for need satisfaction. They may be more receptive to notice the provided need support and, when noticed, they may extract more benefits from it. Conversely, individuals with a history of need frustration would be less sensitive to such opportunities for need satisfaction. They may even be more sensitive to potentially need thwarting events, thereby more readily interpreting them as need frustrating and displaying more maladaptive outcomes following need frustrating events. According to such a sensitisation perspective, students higher in autonomous motivation (who are likely to have experienced more need satisfaction in the past) would benefit more from an autonomy-supportive approach. In contrast, students higher in controlled motivation and amotivation (who are likely to have experienced more need frustration in the past) would benefit less from an autonomy-supportive approach and would be more sensitive to a controlling approach, with more negative consequences as a result.

1.5 The Present Study

Our main research goal was to examine whether students with different motivational orientations towards PE benefit from different teaching styles. We examined this issue using a video-based experimental approach. Students were asked to imagine that they were a student in a randomly assigned autonomy-supportive or controlling videotaped lesson. They were then asked to report on their experiences of need satisfaction and need frustration, engagement, and oppositional defiance vis-à-vis the teacher. The use of videos to induce

teaching style has the advantage of standardisation, while self-reports of teaching style may be coloured by students' personal motivation. Further, compared to written vignettes, videos include more lively material, which increases the ecological validity of the study. We tested the following five hypotheses.

First, on the basis of SDT, we expected that exposure to an autonomy-supportive (relative to a controlling) teaching style would predict engagement and less oppositional defiance (Hypothesis 1). Second, based on theorizing (Vansteenkiste & Ryan, 2013) and previous empirical studies (Haerens et al., 2015), need satisfaction was expected to account primarily for the effect of induced teaching style on the positive outcome (engagement), whereas need frustration would account primarily for the effect of induced teaching style on the negative outcome (oppositional defiance) (Hypothesis 2). Third, we anticipated that more autonomously motivated students would report greater need satisfaction and engagement, while students high on controlled motivation and amotivation would report more need frustration and oppositional defiance, independent from their condition assignment (Hypothesis 3). Fourth, we examined the interplay between students' motivation for PE and experimentally induced teaching style in predicting the outcomes. On the basis of a match perspective, it can be predicted that the effect of teaching style depends on students' motivational orientation, such that an autonomy-supportive style is beneficial only for students high on autonomous motivation and a controlling style is beneficial for students high on either controlled motivation or amotivation. Yet, on the basis of SDT, we expected students' motivation to affect the gradation (but not the direction) of the effects of teaching style (Hypothesis 4), so that students who are more autonomously motivated for PE in general will be more sensitive to autonomy support and will therefore report more positive outcomes after watching the autonomy-supportive teacher. Given that students who are

less optimally motivated would be more sensitive to controlling teaching, they would report more negative outcomes in the controlling (relative to the autonomy-supportive) condition than students who are more optimally motivated. Finally, the inclusion of need satisfaction and need frustration in the model provided us with another opportunity to test the sensitization hypothesis. That is, effects of sensitization could be observed not only in effects of (experimentally induced) teaching style on the needs and the outcomes but also in relations between the needs and the outcomes (Hypothesis 5).

Prior to addressing these hypotheses, in a preliminary study we examined to what extent teachers endorse the idea that a match between teachers' teaching style and students' motivation is required to obtain optimal student outcomes. Specifically, we examined whether teachers would hold the belief that a particular teaching style works best for students with a corresponding type of motivation (i.e., belief in the motivation-dependent effectiveness of teaching style) or, instead, would believe that a particular teaching style yields similar effects irrespective of students' motivation (i.e., belief in the absolute effectiveness of teaching style).

2 Preliminary Study

2.1 Method

Teachers (n=150) who were attending a seminar on extracurricular school sport participation were asked to participate in the study immediately after the seminar. The seminar dealt with the topic of after-school sport, a topic which was unrelated to the present study. Ninety-five teachers agreed to participate, of whom 7 did not complete the entire questionnaires. Ultimately, 88 PE teachers (55 % males) participated. They had an average age of 37 years (SD 11, range 23 - 59 years) and an average of 14 years of teaching experience (SD = 11, range 0 - 39 years). They were teaching in 7th to 12th grade of

secondary school and in different educational tracks (i.e., general, technical, and vocational education).

A first part of the questionnaire consisted of two vignettes describing students with autonomous motivation for PE and students high on controlled motivation for PE. These vignettes were developed for the purpose of the current study and can be obtained from the authors upon request. Following the vignettes describing students' motivation, the questionnaire included two vignettes describing an autonomy-supportive, and a controlling teaching style. These vignettes were developed by Reeve et al. (2014a), and were shortened and adapted to the context of PE. Participants then filled out 2 items, one regarding teachers' belief in the motivation-dependent effectiveness of a teaching style [i.e., "An autonomy-supportive (controlling) style works best for autonomously motivated students (for students with controlled motivation)"] and one regarding teachers' belief in the absolute effectiveness of the teaching styles [i.e., "An autonomy-supportive (controlling) style works best for all students"]. A 1–7 response scale from "completely disagree" to "completely agree" was used to rate both items (separately for an autonomy-supportive and a controlling style).

2.2 Results

Results of paired samples *t*-tests showed that, on average, teachers were more likely to believe in the motivation-dependent effectiveness of an autonomy-supportive style than in its absolute effectiveness [$t(87) = -7.44$, $p < .001$, $M_{\text{motivation-dependent}} = 5.44$, $M_{\text{absolute}} = 3.91$]. Similarly, teachers were more likely to believe in the motivation-dependent effectiveness of a controlling style than in its absolute effectiveness, [$t(87) = -2.23$, $p < .05$, $M_{\text{motivation-dependent}} = 4.33$, $M_{\text{absolute}} = 3.93$]. Independent samples t-tests showed that there were no gender differences in the study variables [*t*-values ranging from -.69 – 1.78, ns]. Participants' age

and years of teaching experience were also unrelated to the study variables. Overall, findings from the preliminary study showed that teachers believe more strongly in the motivation-dependent effectiveness of teaching styles than in their absolute effectiveness.

3 Main Study

3.1 Method

Participants. Three hundred and twenty students from 42 different classes out of two secondary schools in Flanders (Belgium) were recruited for the present study. In Flanders PE is a legally required school subject of the compulsory schooling for all students in secondary school, until the age of 18 years. The students were on average 17.28 years old (*SD* = 1.36 ranging from 15 – 22 years) and 33.1 % (n = 106) of them were boys. The majority of the sample (n = 258 students, 80.6 %) was enrolled in the final years of the vocational track, in which students are professionally prepared to enter the labour market after secondary school. The other students (19.4 %) were in the technical track, in which students are being prepared for technical higher education. The study protocol was approved by the Ethical Committee of Ghent University. Both students and their parents read and signed informed consent forms.

Procedure. A between-subjects design was used with students being randomly assigned to an autonomy-supportive condition or a controlling condition. For practical reasons, the randomization process was performed differently in both schools. In one school the randomisation occurred at the within-class level, with students belonging to the same class being randomly assigned to one of two different multimedia rooms, with both rooms representing the two conditions. In the second school the randomization occurred at the class level, with whole classes being assigned to a single condition, as all students watched the same videos in one and the same multimedia room. The reason for performing the

randomization differently in the second school was the absence of a second multimedia classroom.

The researcher first explained the format of the experiment and allowed the students to ask questions. Then, students completed a paper and pencil questionnaire on their general motivation towards PE. Next, the students watched a series of five short film fragments, which lasted on average 1 min and 26 s. In between each video fragment students filled out a short questionnaire containing items measuring perceived autonomy-supportive and controlling teaching, credibility of the film fragments, anticipated satisfaction and frustration of their psychological needs, and anticipated engagement and oppositional defiance towards the teacher. The experiment lasted for approximately 40 min.

Materials.

Video fragments. Both the autonomy-supportive and controlling condition contained a series of five video fragments displaying typical situations that occur in a regular PE class (e.g., providing help or dealing with disruptive students). Specifically, the situations dealt with a class in which the students were taught the somersault. While the situations themselves were identical in the two conditions, the way the teacher interacted with the students differed. At the beginning of each fragment, a voice over provided a standardized short overview that prepared students for what they would see in that particular fragment. A researcher played the role of the teacher in each of the conditions. This researcher was experienced in teaching gymnastics and was familiar with the concepts of SDT. Ten students who were enrolled in the PE teacher education program acted as secondary school students. The videos were filmed in a sports gymnasium by a professional camera team to ensure good quality footage.

The five video fragments shown in both conditions represented different situations that occur throughout a single class and were presented in a chronological order: (a) a teacher giving verbal instructions at the beginning of the class, (b) a teacher offering help during an exercise, (c) a teacher providing feedback during an exercise, (d) a teacher dealing with disruptive student behaviour, and (e) a teacher discussing and evaluating the class at the end of the class. To ensure that both conditions represented an ecologically valid PE lesson and differed only in terms of teachers' interpersonal style, a detailed script was written for both conditions. Except for the verbal information that came from the teacher, all other interactions were held constant (e.g., students' behaviours and interactions with the teacher). The writing of the scripts proceeded in several steps. First, the authors discussed which autonomy-supportive and controlling strategies would be included, thereby aiming to include a diverse spectrum. To ensure that the scripts and strategies operationalized would be credible and ecologically valid, real-life videotaped PE lessons on gymnastics were watched. This procedure resulted in five detailed scripts for both conditions. In a final phase, these detailed scripts were presented to a panel of experts in the domain of SDT and PE. Based on their suggestions, some final adjustments were made before the videos were recorded.

Measures. All items in the questionnaires were rated on a 5 point Likert scale ranging from 1 *(not at all true for me)* to 5 *(very true for me).*

Students' motivation (assessed before the experiment). To measure students' general motivation towards PE, students filled out the well-validated Behavioural Regulations in Physical Education Questionnaire (BRPEQ; Aelterman et al., 2012). The stem "I put effort in PE classes because…" was followed by items reflecting autonomous motivation (8 items; e.g., "I enjoy PE classes") and controlled motivation (8 items; e.g., "I have to prove

myself"). Amotivation was measured using 4 items (e.g., "I find PE a waste of time"). Cronbach's alphas of these scales were .92, .69, and .79, respectively.

Students' perceptions of teaching behaviour (manipulation check). To determine whether students perceived the conditions as we intended, they completed 4 items immediately after each fragment about whether they perceived the teacher to be autonomy-supportive ("e.g., If my teacher would teach as shown in the video, I would feel that he/she shows interest in me and is willing to listen") or controlling ("If my teacher would teach as shown in the video, I would feel that he/she insists on doing everything in his/her way). Items were based on the Teacher As Social Context Questionnaire (TASCQ; Skinner & Belmont, 1993) and the Psychologically Controlling Teaching (PCT) scale (Soenens et al., 2012). Cronbach's alphas for the autonomy-supportive and controlling scores were .95 and .94, respectively.

Credibility of the videos. To examine how credible and recognizable the video fragments were, students completed a 5-item questionnaire immediately after each fragment. Specifically, these items tapped into the credibility of the teacher's behaviour (e.g., "The teacher's behaviour is credible"), the credibility of the students' behaviour (e.g., "The students' behaviour is credible"), and the credibility of the fragment as a whole (e.g., "The video fragment is credible"). In addition, students were asked to indicate to what extent the videos were recognizable for them, in terms of how comparable they were with their own PE teacher's teaching style (e.g., "My PE teacher teaches in the same way as the teacher in the film fragment") or with the style of teachers of other subjects (e.g., "Many teachers teach in the same way as the teacher in the film fragment"). Cronbach's alphas for the credibility and recognisability scores were .91 and .69, respectively.

***Students' need satisfaction and frustration*.** Need satisfaction and need frustration were measured with a selection of six items derived from the Basic Psychological Needs Satisfaction and Need Frustration Scale (BPNSNF; Chen et al., 2015), a questionnaire that has previously been used in the context of PE (Haerens et al., 2015). Cronbach's alphas of need satisfaction and need frustration were .90. and .81, respectively.

Oppositional defiance. After each fragment participants filled out a single item ("If I would be a student in this particular lesson, I would tend to do the opposite of what the teacher expects me to do"). This item was adopted from a recently developed and validated scale (Vansteenkiste et al., 2014). We computed a total score for oppositional defiance by aggregating scores on this item across the 5 fragments (Cronbach's alpha = .83).

Student engagement. Student engagement was measured after each fragment using a single item ("If I would be a student in this particular lesson, I would commit myself and cooperate"). This item was based on the validated and widely used measure developed by Skinner, Kindermann, and Furrer (2009), and assessed only the behavioural component of engagement. We computed a total score for engagement by aggregating scores on this item across the 5 fragments (Cronbach's alpha =.89).

3.2 Plan of Analyses.

Preliminary Analyses. Because randomization was performed differently in the two schools (i.e., once at the student-level and once at the class-level), we first examined whether randomization was successful, that is, whether students in the two experimental conditions were similar in terms of background variables (i.e., gender, education, age), thereby using a Pearson's χ^2 test, and general motivation for PE as measured prior to the experiment, thereby using a MANOVA. For the manipulation check, we performed two MANOVAs with experimental condition as the independent variable, one with the scores for

credibility and recognizability as dependent variables and one with perceptions of autonomy-supportive and controlling teaching as dependent variables. Finally, we examined the relation between relevant background variables (i.e., gender, education, age) and all the assessed variables by using a MANCOVA with gender and education as fixed factors, age as a covariate, and the variables of interest as dependent variables.

Primary analyses. We conducted a series of Structural Equation Models (SEM) using the Mplus 7.00 software (Muthén & Muthén, 2012) to test our main hypotheses, thereby controlling for relevant background variables (based on the preliminary analyses). A measurement model was created with latent constructs represented by three parcels, which were created through a random selection of the items of each scale (Little, Cunningham, Shahar, & Widaman, 2002). Experimental condition was modelled as a dummy variable [with the autonomy-supportive equalling 0 (reference category) and with the controlling condition equalling 1]. To evaluate the model fit, the Comparative Fit Index (CFI), the Root Mean Squared Error of Approximation (RMSEA), and the Standardized Root Means Square Residual (SRMR) were inspected. According Hu and Bentler (1999), good model fit is indicated by combined cut-off values of .95 or higher for CFI, .06 or lower for RMSEA, and .09 or lower for the SRMR. After estimating the fit of the measurement model, we investigated structural relationships. Unstandardized effects were computed for each path in all structural models through the use of 1000 bootstrapped samples.

To examine the main effects of experimental condition on student engagement and oppositional defiance, we estimated the structural relationships between the experimental condition and the latent constructs representing engagement and oppositional defiance. Second, we tested the intervening role of need satisfaction and need frustration in the relation between experimental condition and engagement and oppositional defiance.

Next, we examined the role of individual differences in motivation for PE. In a first step we added structural relationships between each type of motivation (i.e., autonomous motivation, controlled motivation, amotivation) and student engagement and oppositional defiance. In a second step we examined the latent interactions between each of the three motivational variables and experimental condition in the prediction of the outcomes.

Finally, we included the motivational variables in the integrated model, thereby estimating main effects of motivation on need satisfaction, need frustration, engagement, and oppositional defiance as well as interaction effects between motivational variables and experimental condition on the needs and interactions between motivational variables and the needs on the outcomes.

3.3 Results

Preliminary Analyses. Pearson's χ^2 analyses indicated significant differences according to condition with regard to gender [$\chi^2(1) = 22.57$, $p < .001$] and educational track [$\chi^2(1) = 18.00$, $p < .001$]. Specifically, there were relatively more girls (79%) and relatively more students following the technical track (29%) in the controlling condition, in comparison with the autonomy-supportive condition which contains relatively less girls (54 %) and relatively less students from the technical track (10 %).

The MANOVA indicated no significant differences between both conditions in terms of age or in terms of individual differences in motivation, Wilks' Lambda F (4,306) = 1.25; p =.29; η_p^2 = .02. A MANOVA analysis indicated a multivariate effect of experimental condition on the scores for recognizability and credibility, Wilks' Lambda F (2,317) = 12.41; $p < .001$; η_p^2 = .07. Subsequent univariate analyses indicated that students in both conditions perceived the teacher's behaviour as equally recognizable [F (1,318) = .85, p = .36, η^2 = .00, M_{AS}= 2.50, M_{CON} = 2.41]. However, students watching the controlling teaching style rated the

fragments as being more credible than students in the autonomy-supportive condition [$F(1,318) = 16.87$, $p < .001$, $\eta^2 = .05$, $M_{AS} = 2.89$, $M_{CON} = 3.33$].

Then, we tested for condition differences in terms of perceived autonomy-supportive and controlling teaching. A multivariate effect of condition was found [Wilks' Lambda $F(2,317) = 449.06$; $p < .001$; $\eta_p^2 = .74$], together with two univariate effects, indicating that students in the autonomy-supportive, relative to the controlling, condition perceived the teacher to be significantly more autonomy supportive, [$F(1,318) = 801.21$, $p < .001$, $\eta^2 = .72$, $M_{AS} = 3.85$, $M_{CON} = 1.73$], whereas students in the controlling, relative to the autonomy-supportive, condition perceived the teacher to be significantly more controlling [$F(1,318) = 286.71$, $p < .001$, $\eta^2 = .58$, $M_{AS} = 2.20$, $M_{CON} = 4.10$].

Next, we examined whether the main study variables differed as a function of gender, age, and educational track (see Table 1). The multivariate effects of gender, Wilks' Lambda = .88, $F(7,310) = 6.09$, $p < .001$, $\eta^2 = .12$ and educational track, Wilks' Lambda= .91, $F(7,310) = 4.09$, $p < .001$, $\eta^2 = .09$, were significant, but not for age, $F(7,281) < 1$. Given these results, we controlled for gender and educational track in all subsequent analyses.

Descriptive statistics and correlations are presented in Table 2. Before testing our hypotheses, a measurement model including all assessed constructs was tested. The model fitted the data well [$\chi^2(168) = 266.92$; $p < .001$, RMSEA = .04, SRMR = .04, CFI = .97].

Table 1

Mean-Level Differences in the Study Variables as a Function of Gender and Type of Education

	Gender				Type of Education			
	Male	Female	$F(1,315)$	Eta^2	Technical	Vocational	$F(1,316)$	Eta^2
Motivational Differences								
Autonomous Motivation	3.64	2.94	30.76***	.09	3.21	3.17	.05	.00
Controlled Motivation	1.72	1.68	.27	.00	1.50	1.74	8.18**	.03
Amotivation	1.87	2.34	13.63 ***	.04	1.88	2.26	6.23*	.02
Situation-specific Measures								
Need Satisfaction	2.97	2.54	11.69**	.04	2.16	2.81	19.25***	.06
Need Frustration	2.45	2.87	13.39***	.04	3.06	2.65	8.11**	.03
Engagement	3.75	3.31	11.30**	.03	3.11	3.54	9.33*	.02
Oppositional Defiance	2.16	2.34	2.48	.01	2.44	2.24	2.03	.01

Note. $*p < .05$. $**p < .01$. $***p < .001$.

Table 2

Means, Standard Deviations, and Correlations Among the Study Variables

	Total		Autonomy-Supportive Condition		Controlling Condition							
	M	*SD*	*M*	*SD*	*M*	*SD*	1.	2.	3.	4.	5.	6.
1. Autonomous Motivation	3.18	1.10	3.19	1.17	3.17	1.04						
2. Controlled Motivation	1.70	.60	1.75	.62	1.64	.57	.14*					
3. Amotivation	2.18	1.09	2.24	1.11	2.12	1.06	-.65**	.08				
4. Need Satisfaction	2.69	1.07	3.52	.70	1.85	.64	.14*	.16*	-.05			
5. Need Frustration	2.74	.97	2.10	.68	3.37	.079	.02	.12*	.10	-.65**		
6. Engagement	3.46	1.10	4.04	.84	2.88	1.03	.33**	.10	-.21**	.70**	-.49**	
7. Oppositional Defiance	2.28	.99	1.83	.83	2.73	.94	-.12*	.05	.17*	-.52**	.59**	-.61**

Note. *p < .05. **p < .01. ***p < .001.

Primary Analyses. A first model tested Hypothesis 1, which stated that a controlling (relative to autonomy-supportive) teaching style would predict reduced engagement and greater oppositional defiance. In this structural model the experimental condition was modelled as a predictor of student engagement and oppositional defiance, thereby controlling for student gender and educational track. The model had a good fit [χ^2 (20) = 50.32; $p < .001$, RMSEA = .07, SRMR = .03, CFI = .97]. In line with Hypothesis 1, students in the controlling, relative to those in the autonomy-supportive, condition reporting less engagement (b = -1.14, $p < .001$, 95% CI = [-1.38, -.91]) and more oppositional defiance (b = .98, $p < .001$, 95% CI = [.72, 1.24]).

A second model tested Hypothesis 2, involving the mediating role of need satisfaction and need frustration in effects of teaching style on the outcomes (i.e., engagement and oppositional defiance). In this structural model the needs were modelled as an intervening variable in the relationship between experimental condition and engagement and oppositional defiance, thereby controlling for student gender and educational track. We also allowed the direct paths from condition to engagement and oppositional defiance. Variables at the same level were allowed to correlate. The estimated model [χ^2 (72) = 232.12; $p < .001$, RMSEA = .08, SRMR = .03, CFI = .96] is presented in Figure 1. The direct paths from experimental condition to engagement and oppositional defiance were no longer significant when need satisfaction and need frustration were included in the model. Experimental condition related negatively to need satisfaction and positively to need frustration. Need satisfaction, in turn, related positively to engagement and was negatively related to oppositional defiance, while need frustration related positively to oppositional defiance and was unrelated to engagement. In line with Hypothesis 2, need satisfaction accounted

primarily for the effect of teaching style on engagement and need frustration accounted primarily for the effect of induced teaching style on oppositional defiance.

To address Hypothesis 3, which states that more autonomously motivated students would report greater need satisfaction and engagement, while students high on controlled motivation and amotivation would report more need frustration and oppositional defiance, we added the main effects of interindividual differences in motivation to the two previously tested models, thereby controlling for student gender and educational track. The first structural model, including only engagement and oppositional defiance, [χ^2 (119) = 222.43; p < .001, RMSEA = .05, SRMR = .06, CFI = .96] showed a positive effect of autonomous motivation on engagement (b = .32, p < .05, 95% CI = [.06, .58]). Autonomous motivation was unrelated to oppositional defiance. Controlled motivation was unrelated to engagement and oppositional defiance. The relationship between amotivation and oppositional defiance (b = .41 p = .06, 95% CI = [-.01, .82]) was close to significance. Amotivation was unrelated to engagement. In the second structural model [χ^2 (219) = 453.66; p < .001, RMSEA = .06, SRMR = .05, CFI = .95] all paths between students' general motivation and our variables of interest (i.e., need satisfaction, need frustration, engagement, and oppositional defiance) were allowed. We also included direct paths from condition to engagement and oppositional defiance. Autonomous motivation was positively related to engagement (b = .30 p < .05, 95% CI = [.05, .54]), and unrelated to the other constructs. Controlled motivation was positively related to need frustration (b = .31 p < .01, 95% CI = [.09, .52]), and was unrelated to other variables. Also amotivation was positively related to need frustration, (b = .38 p < .05, 95% CI = [.07, .68]), but unrelated to all other variables.

Next, to test for the moderating role of motivation in the relationship between experimental condition and engagement and oppositional defiance (Hypothesis 4), six latent

interaction effects were tested (i.e., three moderator variables x two outcome variables), while controlling for student gender and educational track. None of the latent interactions in the prediction of engagement were significant (*t*-values ranging between -.39 and 1.27, all ns). In the prediction of oppositional defiance there were two interaction effects that were close to significance as indicated by their p-value: $t = 1.71$, $p = .09$ for amotivation, and $t = -1.65$, $p = .10$, for autonomous motivation. As shown in Figure 2a, the controlling (relative to autonomy-supportive) style yielded a stronger effect on oppositional defiance among students high on amotivation, indicating that students high on amotivation reported that they would display higher levels of oppositional defiance if exposed to a controlling (relative to autonomy-supportive) teaching style. As shown in Figure 2b, being exposed to the autonomy-supportive (relative to controlling) style resulted in lower oppositional defiance scores among students low on autonomous motivation. In other words, students low on autonomous motivation reported that they would be less defiant against the teacher when the teacher relies on autonomy-supportive (relative to controlling) teaching strategies.

Finally, we tested the moderating role of students' motivation in the fully integrated model (Hypothesis 5). We examined whether interindividual differences in motivation moderated any of the structural paths, while controlling for student gender and educational track. Of the 18 interaction terms (3 motivational orientations as possible moderators in the relations between condition and need satisfaction and frustration on the one hand, and in the relations between need satisfaction and frustration and the outcome variables on the other hand), only 2 were significant. Specifically, amotivation and autonomous motivation moderated the relationships between need frustration and oppositional defiance ($t = 2.64$, $p < .01$ and $t = -2.27$, $p < .05$, respectively), in the same way as they moderated the effect between the experimental condition and oppositional defiance. Students high on

amotivation responded more negatively to experienced need frustration, so that they reported higher levels of oppositional defiance. The interaction effects with autonomous motivation indicate that students low on autonomous motivation might benefit more from an absence of need frustrating experiences, when compared to students high on autonomous motivation.

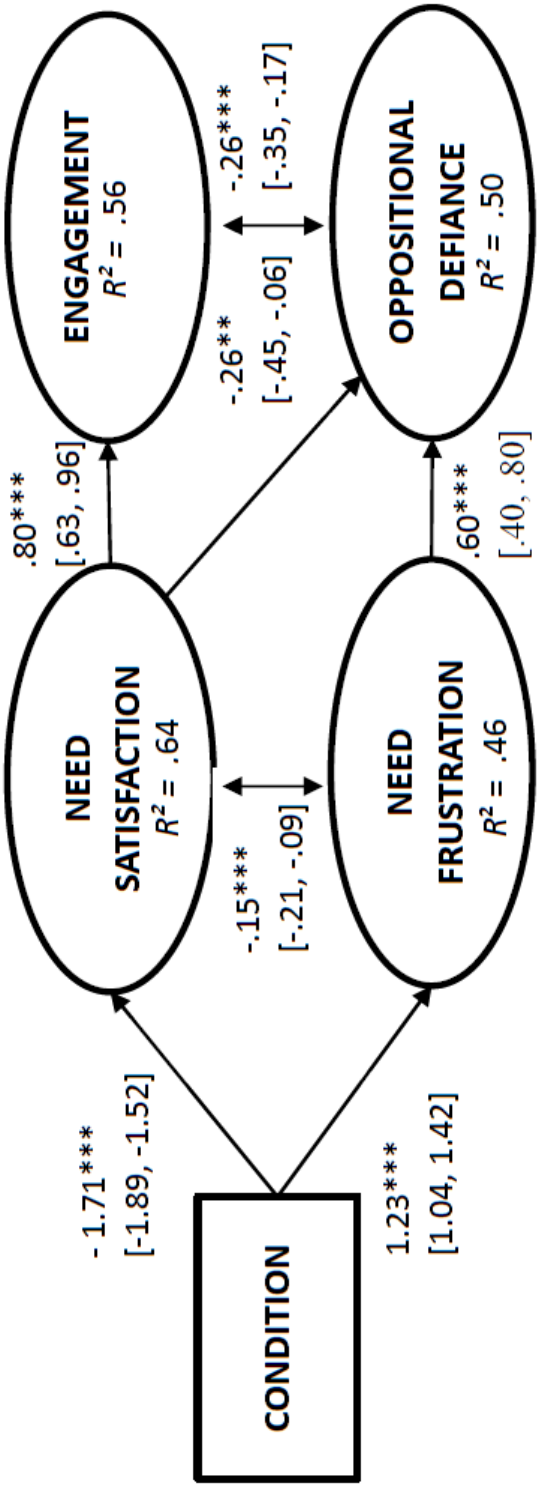
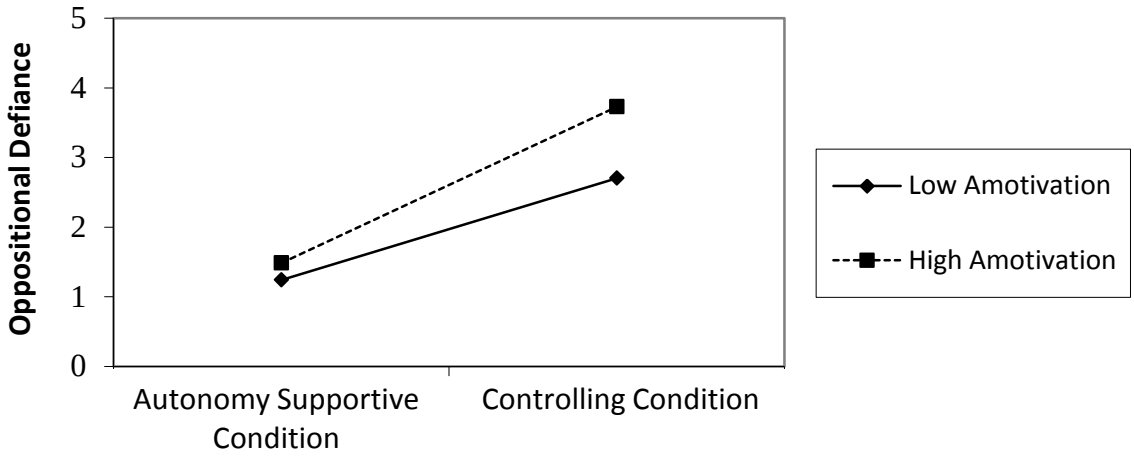
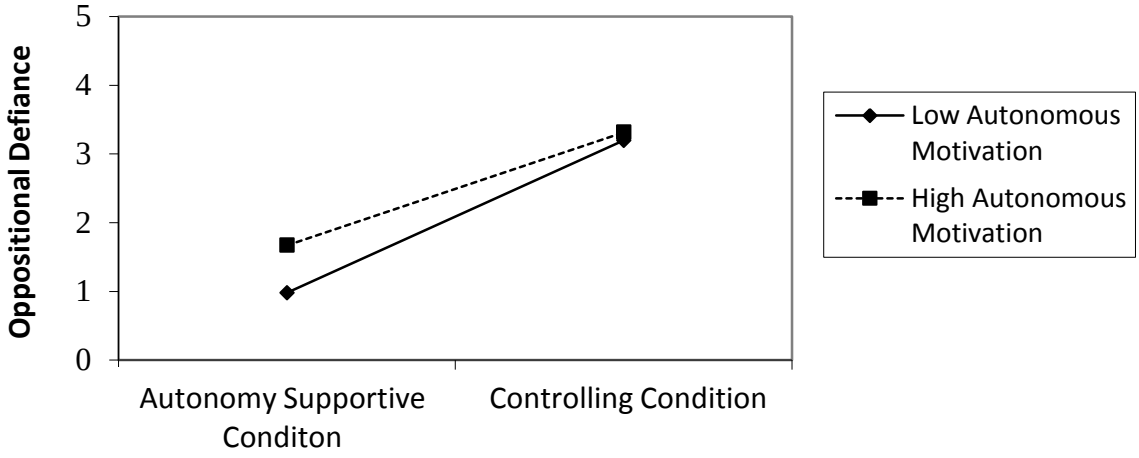


Figure 1. Unstandardized Path Coefficients for Structural Model of the Relation between Experimentally Induced Teaching Style and Student Engagement and Oppositional Defiance Through Need Satisfaction and Need Frustration (Hypothesis 2).



This interaction was close to significance (p = .09), interaction effects were

Figure 2a. Interaction effect Between Amotivation and Experimentally Induced Teaching Style in the Prediction of Oppositional Defiance (Hypothesis 4)



This interaction was close to significance (p = .10), interaction effects were performed with gender and educational track as covariates

Figure 2b. Interaction effect Between Autonomous Motivation and Experimentally Induced Teaching Style in the Prediction of Oppositional Defiance (Hypothesis 4)

4 Discussion

According to SDT, autonomy-supportive PE teachers foster positive student outcomes such as engagement and interest because they effectively nurture students' basic psychological needs for autonomy, competence, and relatedness. When teachers actively thwart the same basic and universal needs through a controlling style (i.e., ignoring students' perspective and by pressuring students to make them think, feel, and act in particular ways); (Reeve, 2009), students are more likely to display maladaptive outcomes (e.g., De Meyer et al., 2014; Haerens et al., 2015). Given these findings, an increasing number of researchers have developed and tested evidence-based interventions to train PE teachers to adopt an autonomy-supportive teaching style (e.g., Cheon et al., 2012; Reeve et al., 2004). During such professional teacher training programs some PE teachers raise doubts about whether in real-life an autonomy-supportive teaching style would always lead to positive outcomes (Aelterman et al., 2013). That is, they suggest that a controlling approach is necessary and effective for at least some students. Results of the preliminary study confirmed that PE teachers more strongly underscored the belief that an autonomy-supportive style is especially effective for autonomously motivated individuals instead of being effective irrespective of students' motivation. Similarly, PE teachers expressed the belief that students high on controlled motivation would benefit most from a more controlling approach. These results were in line with a study by Ng, Thogersen-Ntoumani, and Ntoumanis (2012) which showed that trainee sport and exercise science students perceived autonomy-supportive strategies to be less effective for obese individuals with controlled motivation.

4.1 Effectiveness of Teaching Styles from Students' Perspective

Given PE teachers' belief in the motivation-dependent effectiveness of both autonomy support and control, this issue was examined from the side of students. That is,

we addressed the question whether students' personal motivation when they enter a PE lesson, actually interacts with teachers' interpersonal style to predict outcomes, an issue that has received little attention so far. While the idea that an absolute match between students' type of motivation (i.e., autonomous, controlled) and type of teaching style (i.e., autonomy-supportive, controlling) would be most effective is inconsistent with SDT, SDT does leave room for the possibility that students, depending on their motivational profile, might vary in their sensitivity to different teaching styles (Soenens et al., 2015).

Using a novel video-based approach, we found that students viewing an autonomy-supportive PE teacher reported that they would be more engaged and display lower levels of oppositional defiance, compared to students viewing a controlling teacher. These findings are consistent with a plethora of cross-sectional, longitudinal, and experimental studies documenting the benefits of an autonomy-supportive (compared to a controlling) teaching style for students' learning, well-being, and behaviour (Reeve, 2009).

Further, consistent with recent empirical research (e.g., Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011) and theorizing (Vansteenkiste & Ryan, 2013) distinguishing between experiences of need satisfaction and need frustration, the effect of induced autonomy support relative to control on reported engagement occurred through need satisfaction, whereas the effect of the experimental condition on reported oppositional defiance occurred mainly through need frustration. These findings are consistent with recent evidence in the PE domain for the existence of a dark pathway and a bright pathway in the process of psychological needs (Haerens et al., 2015; Vansteenkiste & Ryan, 2013).

Most importantly, we were interested in the question whether and how students' overall motivation influenced the effects of the videos of teaching behaviours on student-reported outcomes. Students' motivation was found to play a role in two different ways.

First, main effects revealed that students' general motivation had a direct relation to students' need experiences and outcomes. Irrespective of the type of video they had watched, more autonomously motivated students reported higher engagement. Students with higher levels of controlled motivation as well as students with higher levels of amotivation reported more need frustration under both conditions. These main effects suggest that students' trait levels of motivation (which are likely rooted in a longer history of need satisfying and need frustrating experiences in the context of PE) determine to some extent how they experience and respond to experimentally manipulated videos of PE-related situations, irrespective of how the PE teacher behaves in those situations.

Second, we examined interactions between students' motivation and condition on their reports of how they would feel and respond to a PE teacher as shown in the video. Overall, the number of observed interactions was small. Of the 24 interactions tested, only two were significant and two were close to significance, with p-values of .09 and .10, respectively. Further, inspection of the nature of these interactions showed that they did not confirm the match hypothesis, as they were a matter of gradation. That is, students' motivation affected the degree to which the experienced autonomy-supportive (relative to controlling) teaching style and subsequent responses of decreased need frustration predicted outcomes rather than completely altering (reversing) these effects. In none of the four interactions were the condition effects and the effects of reported need frustration cancelled, let alone reversed. Together, these findings suggest that, in contrast to teachers' beliefs regarding the motivation-dependent effectiveness of their teaching style, the moderating role of students' motivation is probably limited. Interpreted differently, our findings suggest that an autonomy-supportive approach will most likely yield adaptive outcomes, even among students with poor quality of motivation, and a controlling approach

will most likely lead to detrimental outcomes even if students are controlled motivated or amotivated.

4.2 Practical Implications

Our findings suggest that PE teachers sometimes hold inaccurate beliefs regarding the effectiveness of an autonomy-supportive or controlling teaching style. This is an important issue that needs to be taken into account when developing professional training programs for PE teachers. That is, the pre-training beliefs that participants might have about the effectiveness of proposed motivating strategies need to be addressed as they may affect participants' receptiveness to the training as well as its effectiveness (Pintrich, Marx, & Boyle, 1993). Indeed, a recent intervention study by Aelterman, Vansteenkiste, Van den Berghe, De Meyer, and Haerens (2014), showed that PE teachers' change in effectiveness beliefs regarding the provision of autonomy support was positively associated with changes in teacher-reported autonomy-supportive behaviours. Hence, it is important that teachers' beliefs are targeted in training programs for PE teachers, as was also suggested by Taylor, Ntoumanis, and Smith (2009), who demonstrated that teachers' beliefs are not always in line with their teaching approach.

The results of the current study furthermore suggest that teachers should not be advised to aim for an absolute match between their teaching style and students' motivation, that is, to be autonomy-supportive only with autonomously motivated students and to be controlling with students with poor quality motivation (i.e., controlled motivation and amotivation). Instead, based on the results of the experiment presented here, it can be hypothesized that also in real-life all students would thrive under autonomy-supportive conditions and suffer from controlling strategies, an issue that warrants further investigation.

We would like to caution, however, that the current findings do not suggest that autonomy-supportive teaching represents a motivational cook book, including recipes that work all the time for all students, as if teachers do not need to adjust their style to students whatsoever. On the contrary, autonomy-support involves an interpersonal style where teachers attempt to identify, nurture, and develop students' inner motivational resources, thereby flexibly adapting their strategies to contextual and student factors. We argue that for teachers to be experienced as need-supportive, it is essential that they take their students' frame of reference. Indeed, such an empathic stance is perhaps the most central feature of a need-supportive teaching style (Vansteenkiste et al., 2010), as it allows teachers to adjust their strategies (to some extent) to student characteristics and to maximally enhance experiences of need satisfaction. For instance, while some autonomy-supportive strategies (such as providing choice and encouraging initiative) might work particularly well with autonomously motivated students because these students are already passionate about physical exercise and sports, other autonomy-supportive strategies might be needed to energize students with low quantity and poor quality of motivation. For those students, it might be relatively more important for the teacher to acknowledge students' negative feelings regarding exercises and to provide a meaningful rationale. Future research manipulating specific autonomy-supportive practices is needed to test these speculations.

4.3 Limitations and Directions for Future Research

Although the use of video-based vignettes is preferable above self-reports, our video-based experimental induction also has two drawbacks. First, although the conditions were distinguished clearly in terms of depicting either autonomy-supportive or controlling teaching behaviours, in real-life many teachers rely on a mixture of strategies, alternating between more autonomy-supportive and more controlling behaviours. Such a pronounced

distinction between the two conditions may have led to strong condition effects and as a consequence it may have led also to an underestimation of the role of students' motivation, as interindividual differences may be especially critical in more ambiguous situations or in situations in which both styles are combined. Another reason why students' motivation plays a minor role in the present study is that students' motivation was measured at a different level (i.e., the contextual level) than students' feelings and outcomes, which were measured at the situational level. Possibly, students' subject-specific motivation (e.g., motivation for gymnastics) could play a more prominent role, as studies have shown that students' motivation for PE may differ depending on the topic at hand (Guay, Ratelle, Roy, & Litalien, 2010). Future research would do well to investigate the moderating role of students' motivation in more ambiguous situations and including both general and situational measures of students' motivation.

Second, because we assessed students' hypothetical responses to the vignettes we cannot tell with certainty whether they would feel and respond the same way in an actual class. Accordingly, future research could further address our research questions by manipulating teaching style in a real-life context (e.g., Mouratidis et al., 2011) and by assessing students' real-life responses and feelings. A third limitation is related to the measurement of engagement and oppositional defiance. Both concepts were only measured with a single item. The items for engagement only captured the behavioural component, while at least two other forms can be distinguished, that is, cognitive and emotional engagement (Fredricks, Blumenfeld, & Paris, 2004). Future research would do well to measure engagement in a more multidimensional fashion. Similarly, oppositional defiance was measured in a general way with a single item. To gain more insight in specific manifestations of defiance (e.g., chatting with friends, not performing the exercise) future

research needs to rely on a more fine-grained measure. Another limitation of our study is the relatively small and fairly homogeneous sample. Clearly, caution is warranted in generalizing the current findings, and future research would do well to examine our proposed model in larger samples with more diversity in terms of, for example, class subject, level of education, and ethnicity. Using larger samples is important because statistical interactions are notoriously difficult to find. Studies need to rely on large samples to obtain sufficient statistical power. At the same time, one may wonder whether interactions that show up only in very large samples are meaningful and sufficiently large in terms of effect size. Although we obtained few systematic moderating effects of students' motivation in this study, it is premature to conclude that this moderating effect can be dismissed.

4.4 Conclusion

Teachers appear to believe that the effects of autonomy-supportive and controlling teaching styles depend on students' motivation for PE. Contradicting these beliefs, however, an experimental study with students showed that students' motivation plays only a modest role in impacting the effectiveness of an autonomy-supportive teaching style on engagement, and oppositional defiance. Hence, if teachers want to promote their students' motivation and thriving, they would do well to adopt an autonomy-supportive stance, even if their students appear to be controlled motivated or amotivated.

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CHAPTER 5

GENERAL DISCUSSION

The overarching aim of the present dissertation was to obtain a nuanced and differentiated picture of teachers' controlling style and its consequences for student motivation and related outcomes. Self-Determination Theory, a macro theory on human motivation (SDT; Ryan & Deci, 2000), was applied as a theoretical framework for this thesis. This final chapter starts with an overview of the findings with respect to the three main aims of the present dissertation, that is, (1) investigating how teachers actually pressure students during PE lessons and how this affects students' motivation, (2) gaining a fine-grained insight in the distinct contribution of internally and externally controlling strategies in relation to student motivation, and (3) exploring the moderating role of student motivation in the relationships between motivating strategies and relevant student outcomes. Next, the practical implications of the findings are discussed. Finally, the limitations of this work and directions for future research are provided, followed by a general conclusion.

1 Overview of the findings of the present dissertation

1.1 Aim 1: Investigating how teachers actually pressure students during PE lessons and how this affects students' motivation

According to SDT, teachers can either support students' basic psychological needs (i.e., competence, relatedness, and autonomy) by creating a well-structured, warm and autonomy-supportive environment (bright side) or thwart students' basic needs by being chaotic, cold, and controlling in the interactions with students (dark side) (Deci & Ryan, 2000; Reeve, 2009). Most of the studies focused on the bright side of teachers' motivating style, and especially on how autonomy-support fosters optimal student outcomes. During the last decade an increasing number of empirical studies has begun to also investigate the dark side, and particularly the role of a controlling style in relation to student outcomes. These studies have demonstrated that controlling strategies are related to maladaptive outcomes, such as poor motivation (Assor, Kaplan, Kanat-Maymon, & Roth, 2005; Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012), maladaptive learning strategies (Vansteenkiste, Zhou, Lens, & Soenens, 2005), low academic achievement and oppositional defiance (Haerens, Aelterman, Vansteenkiste, Soenens, & Van Petegem, 2015). Most often this research has relied on questionnaire-based studies.

A first aim of the present dissertation was to investigate the consequences of a controlling style on student motivation, by using external observations in addition to student perceptions of a controlling style. As such, Study 1 contributed to the existing literature because it took place in a real-life PE lesson setting in which professional PE teachers were videotaped to obtain an objective measure of teachers' reliance on controlling strategies. The addition of external ratings to students' perceptions allows to provide deeper insight in concrete strategies teachers rely on. Table 1 presents the prevalence of the observed

controlling strategies, ranging from 0 (the teacher never makes use of this strategy) to 3 (the teacher constantly makes use of this strategy), and indicates that commanding or using controlling language is the most frequently used controlling strategy relative to the other strategies. More specifically, when teachers were commanding they were constantly telling students what to do, while using imperatives (i.e., Listen to what I am saying, Come here,…). This type of information is hard to obtain from students' reports that often involve more generic items, but is crucial to further advance practice.

The prevalence rates of the observed strategies further show that, on average, teachers do not often engage in controlling strategies. Such low levels of controlling socialization were also found for student perceptions of internally and externally controlling strategies (Study 2) and are quite common in research on teaching (Haerens et al., 2015) and parenting (Barber, 1996).

Table 1.

Mean Values for the Observed Controlling Strategies

Observed items	**Mean**
The teacher…	*0 – 3*
pressures the students by making an appeal to their self-confidence or pride or induces feelings of guilt and shame	.20 (.42)
does not allow input from the students or reacts negatively to their input	.02 (.09)
uses destructive criticism when students are not acting in the way the teacher expects them to	.10 (.21)
is irritated, loses his patience	.08 (.21)
exercises power over the students by interfering and demanding respect	.29 (.43)
yells at the students	.11 (.26)
commands students, uses controlling language and imperatives	.72 (.67)

Furthermore, including external observations has the ability to overcome problems of shared method variance(Haerens, Vansteenkiste, Aelterman, & Van den Berghe, in preperation). Some interesting findings could be observed in Study 1. External observations

and students' perceptions of teachers' controlling style were interrelated, but this relation was far from perfect, which indicated that there is a gap between what teachers actually do and how students perceive these strategies. One explanation for this gap might be that both constructs were measured at a different level. Whereas external observers rated teachers' motivating strategies at the class-level (e.g., yells at the students), students filled-out questions with respect to their own feelings at the individual level (e.g., During this class it seemed like my teacher was always telling me what to do). Another explanation might be that students differ in the way they perceive controlling strategies, differences that may be related to their personal functioning and that require further examination. Next, when teachers were rated as engaging more frequently in controlling strategies by external observers, the students not only reported that they experienced more control during the PE lesson, they also felt more pressured to engage in the lesson, as reflected in their higher scores on controlled motivation. Remarkably, these associations persisted despite the low occurrence of controlling strategies. These results thus suggest that even when teachers rely only sporadically on controlling strategies, this is noticed by the students and has detrimental consequences for their motivation. It seems that students are very sensitive for the teacher's reliance on controlling strategies, which may explain the association with a perceived controlling style and controlled motivation. These findings are consistent with a general principle in social psychology, referred to by Baumeister, Bratslavsky, Finkenauer, and Vohs (2001) as the phenomenon that 'bad is stronger than good'. Because bad events, including controlling strategies, are typically very salient when they occur, even a sporadic exposure to controlling strategies may provoke detrimental effects (Kins, Soenens, & Beyers, 2012). Consistent with these findings, previous studies showed that, in spite of the low

prevalence of a controlling style, it is robustly related with maladaptive outcomes (e.g., Barber, 1996; Roth, Assor, Niemiec, Ryan, & Deci, 2009).

In contrast to the association with controlled motivation, an observed controlling style was not directly related to amotivation. Importantly, it should be noted that amotivation was not completely unrelated to a controlling style, as a perceived controlling style was associated positively to amotivation. Thus, a controlling style according to the raters was indirectly linked to amotivation through students' perceptions.

In the current thesis, we also looked at the relationships between an observed controlling style and student autonomous motivation and student perceptions of an autonomy-supportive style. No associations were found between these variables, which indicated that the dynamics of a controlling style are somewhat distinct from the dynamics of an autonomy-supportive style, which is in line with findings from another study in PE (Haerens et al., 2015). Although these results reinforce the notion of a dark and bright pathway (Vansteenkiste & Ryan, 2013), they also seem a bit surprising. Vansteenkiste and Ryan (2013) assumed that the relation between low need satisfaction and need frustration is asymmetrical. That is, whereas low need satisfaction does not necessarily involve need frustration, need frustration by definition involves low need satisfaction. This assumption of asymmetry leads to the expectation that a controlling style would hamper students' functioning, and would be related negatively to students' autonomous motivation, which was not the case. One limitation in this study was the lack of an assessment of students' need satisfaction and need frustration, which might provide more insight in the process underlying associations between motivating style and student outcomes. This underlying process was further investigated in Study 3, where the relationship between motivating style

and students' engagement and oppositional defiance was investigated with students' need satisfaction and need frustration as intermediate variables.

1.2 Aim 2: Obtaining a more fine-grained insight in the distinct contribution of teachers' internally and externally controlling strategies in relation to student motivation

The second aim of this dissertation was to examine potentially differentiated associations of two different types of a controlling style with students' motivation. Study 2 provided some support for the distinction between internally and externally controlling strategies within the context of PE. Theoretically (Ryan, 1982; Soenens & Vansteenkiste, 2010), students can be pressured by commands, deadlines and shouting by the teacher, such that students will feel externally pressured. However, teachers can also awake an internal form of pressure within the students, such that students put themselves under pressure out of feelings of guilt, shame or anxiety. Evidence for this distinction was provided in three different ways. First, content coders agreed on the assignment of almost all controlling items to either the internally or the externally controlling category. Second, factor analysis on items rated by students indicated that internally and externally controlling strategies can clearly be distinguished as separate dimensions of a controlling style. Finally, relying on cluster analyses evidence was found for profiles characterized rather uniquely by one particular type of a controlling style. These findings suggest that internally and externally controlling strategies can co-occur, and that teachers can also rely either predominantly on internally controlling or externally controlling strategies in their interactions with students.

Remarkably, students perceived their teacher as relying more on externally controlling strategies, relative to internally controlling strategies. The externally controlling strategies, such as commanding and using controlling language, were also observed to occur

more frequently in Study 1, relative to internally controlling strategies (e.g., appealing to students' self-worth or pride by inducing feelings of guilt and shame). A possible explanation for the relatively high occurrence of externally controlling strategies might be that a teacher-centered approach is widely prevalent among PE teachers (Curtner-Smith, Hasty, & Kerr, 2001; Kulinna & Cothran, 2003; Mawer, 1999; Mosston & Ashworth, 1990, 2002; Penney & Evans, 1999). Such a teacher-centered approach involves a commanding and directive style, which may, under specific circumstances, be experienced as externally controlling. The relatively low occurrence of internally controlling strategies may be due to the fact that the use of these strategies depends relatively less on contextual factors (e.g., lesson goals and content, safety issues…), but instead is more related to personal characteristics of the teachers (e.g., maladaptive perfectionism, contingent self-esteem). For example, perhaps teachers who hold very high standards regarding their own functioning might probably be more internally controlling towards their students, relative to teachers who are less perfectionistic.

This evidence for a distinction between internally and externally controlling styles raises the question whether both types of controlling styles may relate differentially to students' motivation. Although internally and externally controlling styles were quite strongly positively interrelated, the association with students' motivation was driven mainly by the internally controlling style. Specifically, the internally controlling style was related not only to higher levels of introjected regulation in students, but also to higher levels of external regulation and amotivation, and to lower levels of identified regulation and intrinsic motivation. At the level of zero-correlations, similar associations between the externally controlling style and motivational outcomes were found, yet the externally controlling style did no longer predict any of the motivational outcomes when students' perceptions of the

internally controlling style were controlled for. This finding is, to some extent, consistent with findings of Hein, Koka, and Hagger (2015) who demonstrated that teachers' internally controlling strategies (i.e., negative conditional regard and intimidation) were positively related to higher levels of anger and bullying among students, whereas externally controlling strategies (i.e., controlling use of praise and rewards and excessive controlling behavior) were unrelated to these outcomes when taking into account effects of the internally controlling strategies. Analogous to the findings of the variable-centered analyses, the person-centered analyses showed that differences in motivational outcomes according to profiles of perceived controlling style were driven mainly by the internally controlling style and to a lesser extent by the externally controlling style. Another unexpected result was that students in the predominantly externally controlling cluster even reported the highest levels of intrinsic motivation.

Three potential explanations can be put forward for the stronger detrimental effects of an internally controlling style. First, an internally controlling style (relative to externally controlling style) was rated both by the students (Study 2) and by external raters (Study 1) as being less common. This is confirmed by the profile analyses which showed that while there were profiles that scored low on an internally controlling style, no such profiles existed for an externally controlling style. It is possible that internally controlling strategies are considered less normative or accepted in the PE context, which might explain why they would be more detrimental to students' motivation. There is some evidence in research on parenting that controlling strategies are somewhat more harmful when they are less normative in a particular cultural context (Lansford et al., 2005). However, the normativeness of specific controlling strategies does not fully cancel out the effects of these controlling strategies. As such, the difference in normativeness is unlikely to fully account for

our findings. Second, compared to internally controlling strategies, externally controlling strategies such as yelling or counting down (e.g., 'You have five seconds to be back, five, four, three…') may be used more often towards the class as a whole rather than towards a student individually. In contrast, internally controlling strategies such as paying less attention or being less friendly are perhaps more commonly directed towards individual students, so that these strategies may be a more direct threat to students' need for autonomy and have a stronger impact on students' motivation. A final explanation relates to students' interpretation of an externally controlling style as a relatively more benign motivating style. Some students may even interpret the reliance on an externally controlling style, at least in the absence of internally controlling strategies as a sign of the teacher's involvement and engagement, because they put a lot of energy into the lesson and are committed to the students and their learning process. This could also provide a possible explanation for the unexpected result that students in the predominantly externally controlling cluster reported the highest levels of intrinsic motivation, even higher than the low controlling cluster. We hypothesize that teachers who were predominantly externally controlling, come across to students as more energetic and passionate relative to teachers low on controlling. It would be interesting to investigate whether students who rated their teacher as predominantly externally controlling, would also rate their teachers as high on need support. Finally, in some cases, students may feel that externally controlling strategies are sometimes warranted. For instance when the teachers aim to encourage performance (e.g., synchronic dancing) or when security issues are at stake (e.g., children learning to swim). Clearly, more research is needed to address the way students interpret and give meaning to instances of a controlling style.

1.3 Aim 3: Examining the moderating role of student motivation in the relationship between teachers' motivating style and student outcomes

Seemingly in contrast with the detrimental effects of teachers' controlling style on students' motivation documented in Study 1 and 2, some teachers believe that a controlling style is not harmful for everyone. To illustrate, in a qualitative study using focus groups, on the appreciation of a continuous professional development (CPD) training on need-supportive style (Aelterman et al., 2013), teachers sometimes expressed their doubts about whether in real life an autonomy-supportive style would always lead to positive outcomes; instead, they suggested that a controlling style is necessary and effective for at least some students. Consistent with this, a preliminary study in Chapter 4 showed that most teachers hold the belief that autonomy-supportive strategies work best for optimally motivated (i.e., autonomous motivation) students, whereas a controlling style is effective in motivating students with suboptimal motivation (i.e., controlled motivation and amotivation).

Given that many teachers seem to have doubts about the generalization of the effects of an autonomy-supportive and a controlling style across students with different motivational orientations, we were interested to see whether these doubts are warranted. Whereas in Study 1 and 2 motivation was modeled as an outcome of a controlling style, in Study 3 motivation was investigated as a moderator in the relationship between a controlling style and student outcomes. That is, we addressed the question whether students' personal motivation actually interacts with teachers' motivating style to predict outcomes. The idea that an absolute match between students' type of motivation (i.e., autonomous, controlled) and type of motivating style (i.e., autonomy-supportive and controlling) would be most effective, is inconsistent with the SDT's assumption that all student benefit from need support. Still, SDT leaves room for the possibility that students, depending on their motivational profile, might vary in their sensitivity to different motivating

styles (Soenens, Vansteenkiste, & Van Petegem, 2015). To examine this possibility, an experimental design was used, thereby relying on film fragments of an autonomy-supportive and a controlling style.

Results of Study 3 showed that students' motivation played a role in two different ways. First, students' general motivation was directly associated with students' need experiences and outcomes. Specifically, irrespective of whether students' had watched an autonomy-supportive or controlling style, more autonomously motivated students reported higher engagement. In contrast, students with higher levels of controlled motivation and amotivation reported more need frustration, irrespective of whether they had watched an autonomy-supportive or controlling style. These main effects suggest that students' trait levels of motivation (which are likely rooted in a longer history of need satisfying and need frustrating experiences in the context of PE) determine to some extent how they experience and respond to hypothetical PE-related situations, irrespective of how the PE teacher behaves in those hypothetical situations.

In addition to the main effects, interaction effects of students' motivation on the relationships between controling style and students' experiences and responses on the film fragments were investigated. Overall, the moderating role of student motivation was limited and the few interactions that were found did not confirm the match hypothesis. Students' motivation affected only the degree to which hypothetical autonomy-supportive (relative to controlling) strategies and subsequent decreased perceptions of need frustration predicted outcomes rather than completely altering (reversing) these effects. Together, these findings suggest that, in contrast to teachers' beliefs regarding the motivation-dependent effectiveness of their motivating style, the moderating role of students' motivation is probably limited. Interpreted differently, our findings suggest that an autonomy-supportive

style will most likely yield adaptive outcomes, even among students with poor quality of motivation, and a controlling style will most likely lead to detrimental outcomes even if students are controlled motivated or amotivated. These findings are in line with the basic assumptions of SDT.

2 Limitations and future directions

A first limitation of the present work is that all three studies were limited to only one dimension of teachers' need thwarting style. Future research would do well to examine a controlling style in relation to cold and chaotic strategies. This may provide more detailed insights in the associations and interactions between dimensions of a need thwarting style and students' outcomes. Relatedly, although the dynamics of need supportive (i.e., autonomy support, relatedness support, and structure) and need thwarting are quite distinct (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Haerens et al., 2015; Vansteenkiste & Ryan, 2013), it might be interesting to investigate the interplay between both dynamics. Up until now, a few studies have investigated whether an autonomy-supportive style might buffer the impact of a controlling style. These studies have adopted a person-centered approach to investigate this matter in the context of coaching (Matosic & Cox, 2014) and teaching (Amoura et al., 2015; Haerens et al., in preparation), and revealed disparate results. While Haerens et al. (in preparation) demonstrated that the combination of autonomy-support and controlling was better than a predominantly controlling style, it was also found that this combination was worse for many outcomes (e.g., students' learning progression), relative to a predominantly autonomy-supportive style. Other studies did not find significant differences between the cluster (high control – high autonomy) and (low control – high autonomy) on student outcomes (e.g., Amoura et al., 2015; Matosic & Cox, 2014).

Past research in the parenting context has shown that interactions between controlling parenting and need-supportive parenting are sometimes counterintuitive. For instance, a number of studies have shown that parental responsiveness/warmth exacerbates rather diminishes the detrimental effects of controlling parenting, possibly because the combination of controlling parenting and warmth/responsiveness creates a loyalty conflict (e.g., Aunola & Nurmi, 2005; Wouters, Doumen, Germeijs, Colpin, & Verschueren, 2013). Possibly, such complex and counterintuitive interactions occur also in the context of PE. Future research on interactions between dimensions of teacher need support could be inspired not only by the SDT perspective but also by other theoretical frameworks (e.g., attachment theory, socialization models, and inter-personal theory). Whereas the role autonomy-support and structure are well investigated within the SDT (e.g., Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009), studies based on the aforementioned theoretical frameworks focused mainly on the role of warmth/responsiveness (i.e., relatedness) and to a lesser extent on behavioral control (which is somewhat related to structure). Future research could be inspired by these studies to get a better understanding how relatedness support, structure, and autonomy-support interact to predict students' motivational outcomes.

In relation to these recommendations, it might be interesting to investigate the role of the teacher within the broader network of social relationships of students with their parents, friends, and peers. Regarding parents and friends, it might be the case that autonomy support experienced outside the classroom (e.g., at home or during leisure time) can provide a buffer against teachers' controlling style. Classmates also may play a role in several ways. Pressuring a student (especially when using interpersonal comparison) possibly affects the students' social status and may, as such, elicit competition and disagreement

between students. This rivalry may possibly also trigger conflicts in the classroom. On the other hand, students with high perceived popularity (i.e., social prominence in a peer group) within the class may provoke an open conflict with the teacher in order to perpetuate or even strengthen their perceived popularity. A longitudinal study in primary education indeed showed that higher perceived popularity predicted more teacher-child conflicts, which, in turn and in itself, predicted higher perceived popularity (De Laet et al., 2014). Another way in which peers can be important, is by the norms they hold about the importance of PE. A study in PE revealed that students can feel pressured by their peers for not cooperating in PE classes because PE is not 'cool' (Aelterman, Vansteenkiste, Soenens, & Haerens, in revision). The interplay between a teacher using a controlling style and pressure from peers can create an explosive cocktail, resulting in motivational problems such as oppositional defiance.

Another limitation of this dissertation is the dependency on mainly cross-sectional data. Future studies can extend this work by investigating teachers controlling style using longitudinal designs. A longitudinal approach might shed a different light on how teachers' controlling strategies affect students' behavior and emotions. For instance, it would be interesting to see how the repeated use of controlling strategies might affect students over time and to what extent these effects are reciprocal in nature. We hypothesize that students might affect teachers' motivating strategies, such that teachers will become more controlling when students are less optimally motivated or when they do not act in line with teachers' expectations. Several studies have investigated how students' characteristics such as students' behavior, motivation, engagement and social status relate to teachers' functioning in class (Doumen et al., 2008; Hughes & Chen, 2011; Roorda, Verschueren, Vancraeyveldt, Van Craeyevelt, & Colpin, 2014; Van den Berghe, Vansteenkiste, Cardon, Kirk, & Haerens, 2014). To the best of our knowledge, only one study has investigated the

reciprocal effects in student-teacher interactions with regard to a controlling style in the context of PE. This observational study revealed that students' disengagement at the beginning of the lesson provokes a controlling style later on in the same lesson (Van den Berghe, Cardon, Tallir, Kirk, & Haerens, in press).

Some additional directions for future research follow from specific findings in this dissertation. As we found evidence for the existence of a dark pathway from a controlling style to maladaptive motivation (Study 1) and to oppositional defiance through need frustration (Study 3), it would be interesting to see in future research whether a controlling style is also related to other lesson-specific variables (e.g., superficial learning strategies, disengagement in the PE lesson, resentment towards the PE teacher) and to other variables at a more general level (e.g., acting immoral or bullying other students). Such research may help to convince teachers of the detrimental effects of a controlling style. Today, only few studies examined specifically the effects of a controlling style on students' learning outcomes (see Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004, for an exception). Vansteenkiste et al. (2004) found that a controlling style (relative to an autonomy-supportive style) was negatively related to adaptive, learning-related outcomes (e.g., conceptual learning, persistence).

Research on the different faces of teachers' controlling style and their relationships with important student outcomes is scarce. More research is definitely needed to understand the different expressions of a controlling style and their differential associations with students' motivation and other important outcomes. Therefore, we would like to emphasize the importance of specifying the type of a controlling style in future research. In our first study we observed teachers' controlling style but we did however not specify whether teacher rely either on an internally or externally controlling style. Future research

would do well to improve the observation coding system by creating items that tap into specific forms of a controlling style. In particular, items with regard to an internally controlling style are in the current coding system under-represented. As teachers' internally controlling style is sometimes more implicit (e.g., showing facial disregard) and therefore harder to observe, good footage is required and teachers' facial expression must be accurately captured. Action cameras like GoPro are capable to record and capture verbal and non-verbal expressions of the teacher. Future research can make use of those devices, in addition to a fixed camera, to get a better insight in the different faces of a controlling style. The findings of this dissertation encourage researchers to report the separate effects of an internally and externally controlling style on a wide range of student outcomes, also by means of observations.

Another interesting avenue for future research would be to explore the relation between teachers' controlling style and students' motivation from a teacher's perspective. How do teachers think a controlling style affects students' motivation? One could use film fragments of a person teaching in a controlling way to let teachers imagine how these style would affect students' motivation. Such research may help to understand which controlling strategies are or are not generally accepted by teachers. Especially those controlling strategies that are generally accepted deserve attention during CPD programs for teachers. In addition, as it might be difficult to let teachers talk about their own engagement in controlling strategies, such videos can help to open a discussion on this topic.

It would also be interesting in future research to include teacher-related antecedents of a controlling style to test the extent to which antecedents are related specifically to an internally and externally controlling style. Van den Berghe et al. (2013) found that PE teachers with a controlled causality orientation (i.e., a dispositional tendency to perceive

pressure in one's environment and to act because of controlled reasons) are more inclined to engage in need-thwarting strategies. Beausaert, Sierens, Soenens, and Dochy (2009), showed that teachers' maladaptive perfectionism predicted teachers' engagement in internally controlling strategies. However, it is less clear which antecedents will predict teachers to use externally controlling strategies. We expect that, next to personal characteristics, also pressure from below (e.g., students) and above (e.g., principals) will direct teachers to externally controlling strategies (Pelletier, Séguin-Lévesque, & Legault, 2002).

Finally, as stated in the introduction the present dissertation is embedded within a motivational rather than an educational framework, making this work possibly less accessible for researcher from the educational field. Therefore, we would advise future researchers to keep also the educational framework (Valcke, 2010) in mind as it might help to understand how a motivating style can infiltrate at different aspects of the teachers' didactical approach.

3 Theoretical contributions

The present work contributes to the theoretical innovation of the Self-Determination Theory in different ways. While conceptually a motivating style is to be considered as either autonomy-supportive or controlling because it represents a different underlying orientation (i.e. presence or absence of confidence in young peoples' tendency and capabilities to grow, e.g. Deci, Schwartz, Sheinman, & Ryan, 1981; Reeve, 2015) in reality an autonomy-supportive and controlling style are perhaps not necessarily fully opposite, and may even co-occur (e.g., Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011). The current dissertation is theoretical innovative because we demonstrated the unique dynamics of a controlling style, which support the hypothesis that controlling is more than just the

absence of autonomy support. Specifically, we demonstrated that a controlling style is stronger related to maladaptive motivation (i.e., controlled motivation and amotivation), relative to optimal motivation (i.e., autonomous motivation). A second innovative aspect of the present work is related to the concept of need frustration. For a long time need satisfaction has been consider as "thé" mediator in the relationship between motivating style (autonomy-supportive and controlling style) and outcomes. However, recently it has been suggested that apart from need satisfaction, need frustration might account for the relationship between a controlling style and maladaptive outcomes. (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011; Vansteenkiste & Ryan, 2013). In our experimental study (i.e., Study 3) the relationship between the autonomy-supportive style and positive outcomes (i.e., student engagement) was mainly mediated by need satisfaction, while need frustration functioned as a mediator in the relationship between a controlling style and maladaptive outcomes (i.e., oppositional defiance). A third innovative aspect is related to the role of students' motivation in SDT conceptual models. In contrast to the usual role of motivation as a mediator in the relationship between motivating style and outcomes, we explored motivation as a moderator in this relationship. It has been argued that the effects of a motivating style are universal without being uniform for all students (Soenens et al., 2015). In line with this we found that a controlling style is generally harmful, but might hamper some students' functioning somewhat more than others.

4 Practical implications

We provided clear evidence that internally controlling strategies are a threat for students' motivation and behavioral outcomes in PE. As such, a first recommendation following from the present dissertation relates to the importance of informing teachers about the detrimental consequences of engaging in internally controlling strategies.

Whereas current SDT-based CPD programs are primarily focusing on how teachers can engage and motivate students during their lessons in becoming more autonomy-supportive (e.g., Aelterman et al., 2013), future programs also focusing on how teachers can avoid being controlling would be of added value.

As an internally controlling style is often less observable, or less explicitly present, it might be harder for teachers to acknowledge or recognize their own engagement in an internally controlling style. Hence, it might be important and valuable to create opportunities for teachers in the field to gain insight and awareness about their own motivating style and how this comes across with their students. The observational coding system used in Study 1 might be helpful in recognizing specific controlling strategies in this regard. In contrast to an externally controlling style which is generally easier to observe (e.g., commanding, shouting, and punishing), an internally controlling style (e.g., conditional regard, inducing feelings of guilt and shame) is sometimes more covert and subtle and therefore harder to detect and to be identified by the teachers themselves. As such, we would recommend educators from higher education teacher education programs and trainers in evidence-based CPD programs to use the observational tool and videos developed through the current dissertation to increase (pre)teachers' insight in the manifestation of both an externally and internally controlling style.

The observational coding system might also be an added value in helping student teachers to enhance their motivating style. For instance, student teachers can be asked to videotape their fellow student, which provides them with the opportunity to jointly analyze videos afterwards with the observational instrument as a basis. Teacher trainers on the other hand can also use it to evaluate student teachers on their motivating style. Finally, we believe that the observational instrument might also be helpful for principals and teachers to

provide colleagues with feedback about their motivating style. Although the observational coding system yields many opportunities, it is important to provide potential users an extensive training to make them familiar with the exact meaning of the items to avoid that items might be coded or interpreted in a wrong way.

As opposed to the results of an internally controlling style, the picture for an externally controlling style was less clear. In the absence of an internally controlling style it might even elicit intrinsic motivation among students. However, we would not advice teachers to act in a externally controlling way, because externally controlling strategies were strongly related to internally controlling strategies, and because studies in other domains provided evidence for the detrimental effects of external control (Assor et al., 2005; Gershoff, 2013; Gershoff, Lansford, Sexton, Davis-Kean, & Sameroff, 2012).

Second, besides informing teachers about the consequences of their controlling strategies, it is also recommended to make them aware about the universality of these consequences. Specifically, the present findings suggested that teachers sometimes hold inaccurate beliefs regarding the effectiveness of autonomy-supportive and controlling strategies (Study 3). Many teachers believe in an absolute match between their motivating style and students' motivation, thereby assuming that autonomy-supportive strategies only work with autonomously motivated students whereas controlling strategies are primarily effective with students with low quality motivation (i.e., controlled motivation and amotivation). Yet, this could not be confirmed in the current dissertation. Findings indicated that a motivation-dependent style is not preferred because students anticipated that they would suffer from a controlling style irrespective of their motivational orientation. However, these findings do not imply that teachers cannot adjust their motivating style to students whatsoever. Particularly for teachers' engagement in autonomy support, the picture is more

nuanced. Autonomy support involves an motivating style where teachers attempt to identify, nurture, and develop students' inner motivational resources thereby using a variety of strategies adapted to contextual and student factors such as providing choice, encouraging initiative taking, and providing a meaningful rationale. We argue that for teachers to be perceived as need-supportive by the students, it is critical for teachers to take their students' frame of reference. Indeed, such an empathic stance is perhaps the most central feature of a need-supportive style (Vansteenkiste, Niemiec, & Soenens, 2010). Taking the students' perspective allows teachers to adjust their strategies (to some extent) according to students' needs, in order to maximally enhance experiences of need satisfaction. For instance, while some autonomy-supportive strategies (such as providing choice and encouraging initiative) might work particularly well with autonomously motivated students because these students are already passionate about physical exercise and sports, other autonomy-supportive strategies might be needed to energize students with low quantity and quality of motivation. For those students, it might be relatively more important for the teacher to acknowledge students' negative feelings regarding particular exercises and to provide a meaningful rationale for doing the exercises. Teachers can also adapt their autonomy-supportive strategies to contextual factors (e.g., lesson content, moment of the lesson, accommodation). For instance, when instructing the students at the beginning of a lesson, a rationale might be needed to make students aware of the usefulness of the activity, which might energize them to become engaged. Afterwards, when students have some knowledge about the exercises and have experienced where their interests lie, providing choice can help to keep them optimally motivated to persist.

Finally, when providing teachers with the advice to refrain from controlling strategies and to let them fully understand the detrimental effects of these practices, it is important to

clearly distinguish controlling strategies from a teacher-centered approach. A teacher-centered approach is still generally accepted and quite popular among PE teachers because this approach was common practice at the time they were students themselves.

In practice, teachers easily mix up a teacher-centered approach and a controlling style. However, they are not interchangeable. As such, it is important to first explain to teachers the difference between the concept of autonomy, as used within SDT, and the concept of independence. Independence refers to the interpersonal issue of not relying on others (in this case the teacher) and can be translated to the educational context as a student-centered approach. Autonomy on the other hand, as defined within SDT, reflects the intrapersonal and phenomenological experience of volition and choice. The opposite of autonomy is not dependence or a teacher-centered approach (i.e., relying on the teachers' guidance and decisions), but "controlling", (i.e., the experience of feeling controlled and manipulated). As a consequence, the concepts of an autonomy-supportive style and student-centered approach (i.e., independence) are distinct, much like the concepts of controlling style and teacher-centered approach (i.e., dependence) (Chirkov, Ryan, Kim, & Kaplan, 2003; Vansteenkiste et al., 2005).

5 General conclusion

In conclusion, the present dissertation aimed to add to the literature on need thwarting and controlling styles in the context of PE, which is still in its infancy. Although we found that teachers engage only rarely in controlling strategies, if they do, it might have detrimental consequences for students' motivation and related outcomes. We also found some evidence that a controlling style is a multi-faceted concept manifesting in at least two different forms, that is, an internally and an externally controlling style. Although internally controlling strategies, relative to externally controlling strategies, were less frequently

reported by the students, these strategies were particularly strongly associated with maladaptive outcomes. The present dissertation also provides initial evidence that all students suffer under a controlling style (and benefit from autonomy-support) irrespective of their own motivation, a finding that is counter-intuitive for many teachers. The observation tool and the videos developed in the context of the current study can serve as a tool to help teachers gain insight and to raise awareness about their own engagement in controlling strategies and how these strategies are perceived by their students.

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SUMMARY

"Come on Dean, just throw and catch (irritated). A boy of your age should be able to do this naturally. NO, NO, NO . . . STOP, NOT GOOD, come over here."

Previous studies on student motivation showed that teachers' motivating style affects how students experience lessons in school. The studies in the current dissertation investigated teachers' motivating style and student motivation against the background of the Self-Determination Theory (SDT; Deci & Ryan, 2000), a macro theory on human motivation. Central to this theoretical framework are students' basic psychological needs, that is, autonomy, relatedness, and competence that can be nurtured or frustrated. While previous studies mainly focused on the bright sight of teachers' motivating style, that is, how teachers can support students' needs to obtain optimal student functioning, the present thesis situated in the context of physical education (PE), examined the dark side of teachers' motivating style, that is how teachers can thwart students' needs by being controlling. For a first aim we used a multi-method approach (observations, self-reports) (a) to get a better understanding how a controlling style can manifest in the context of PE and (b) to examine the relationship between a controlling style and students' motivation. Second, we examined the relevance of a more fine-grained conceptualization of a controlling style. More specifically we examined whether an internally controlling style, that is, inducing feelings of guilt and shame can be distinguished from an externally controlling style, that is, punishing and threats with sanctions. In addition the differential associations with students' motivation were also examined. Finally, we investigated whether a controlling style yield detrimental effects for all students independent from their motivation for PE. The findings of the first cross-sectional study with observations of a controlling style during specific PE lessons indicate that commanding or using controlling language are the most frequently used

controlling strategies (Chapter 2). In addition the results show that both the perceptions and observations of a controlling style were related to less optimal forms of motivation. Students who were exposed to a controlling style act more out of pressure (i.e., controlled motivation, e.g., “I put effort in the past PE lesson because I have to prove myself”). In addition, observations of a controlling style were also indirectly related to more amotivation (e.g., “I did not see the value of the past PE lesson”) through students’ perceptions of a controlling style. In a second cross-sectional study (Chapter 3) evidence was provided for the conceptual difference between an internally and externally controlling style in three different ways. Experts in the field of SDT judged whether an item was internally or externally controlling. Next, on the basis of factor analyses and cluster analyses on students’ measurements of a controlling style, a meaningful distinction was made between both facets of a controlling style. Further, results showed that the relationships with students’ motivation were more strongly driven by an internally controlling style. For an externally controlling style, the expected positive relationships with maladaptive motivation were not found after statistically controlling for an internally controlling style. Finally, in an experimental study with film fragments (Chapter 4) it was found that a controlling style holds detrimental effects for all students, independent from their general motivation for PE. Results showed that students who watched a teacher using a controlling style indicated lower levels of engagement and higher levels of oppositional defiance, relative to students watching a teacher adopting an autonomy-supportive style. These results were mainly independent from student general motivation for PE, and were not in line with teachers’ expectations (“Some students need to be pressured, especially those who are not willing to cooperate”).

The present thesis investigated the dark side of teachers' motivating style and tried to get a better understanding of the detrimental effects of it, in addition to the bulk of studies that investigated the bright side of teachers' motivating style. In general we can conclude that a controlling style plays a unique undermining role in students' motivation for PE. The undermining role of a controlling style was found to be independent from students' general motivation for PE and applied to all students. Evidence was provided for a meaningful distinction between an internally and externally controlling style. It was especially an internally controlling style that predicted maladaptive motivation. In practice it is important not only to train teachers how to obtain optimally motivated students, but also to make students aware of the pitfalls of a controlling style.

SAMENVATTING

"Komaan Daan, gewoon gooien en vangen (op een geïrriteerde toon). Een jongen van jouw leeftijd zou toch wel in staat moeten zijn om een bal te vangen. Nee, nee,… niet goed, kom hier!

Onderzoek naar de motivatie van leerlingen heeft aangetoond dat de motiverende stijl die leerkrachten hanteren, een belangrijke factor is in hoe leerlingen lessen ervaren. Vele van deze studies hebben zich gebaseerd op de Zelf-Determinatie Theorie (ZDT; Deci & Ryan, 2000), een motivatietheorie die ervan uitgaat dat leerlingen optimaal zullen functioneren binnen een context waarbij leerlingen hun psychologische basisbehoeften worden ondersteund (autonomie, verbondenheid en competentie). Terwijl in het verleden sterk gefocust werd op hoe leerkrachten leerlingen optimaal kunnen motiveren willen we met het huidig proefschrift, tevens gebaseerd op de Zelf-Determinatie Theorie, nagaan hoe een controlerende stijl in relatie staat tot motivatie van leerlingen tijdens de les LO. Een controlerende stijl wordt binnen de Zelf-Determinatie Theorie omschreven als gedragingen die leerlingen onder druk zetten en die de fundamentele psychologische basisbehoeften van leerlingen ondermijnen (vb. dreigen met sancties, straffen, roepen,…).

Een eerste doel was om controlerende strategieën te bevragen bij leerlingen en daarnaast ook te laten observeren door externe observatoren, om zo (a) beter zicht te krijgen op concrete manifestaties van een controlerende stijl in de context van LO en (b) aan de hand van een multi-methode benadering de samenhang tussen een controlerende stijl en de motivatie van leerlingen na te gaan. Ten tweede werd de relevantie onderzocht van een conceptuele verfijning binnen het concept van een controlerende stijl. Meer concreet werd nagegaan of intern controlerende strategieën, waarbij schuld- en schaamtegevoelens worden opgeroepen, kunnen worden onderscheiden van extern controlerende strategieën,

waarbij de leerkracht eerder gebruik zal maken van sancties en straffen. Verder werd onderzocht of deze beiden facetten van een controlerende stijl verschillend samenhangen met leerlingen hun motivatie voor LO. Tot slot werd getoetst of het nefaste effect van een controlerende stijl voor alle leerlingen geldt, onafhankelijk van leerlingen hun algemene motivatie voor het vak LO.

De bevindingen uit een eerste cross-sectionele studie met observaties van leerkrachten hun controlerende stijl tijdens de les LO (Hoofdstuk 2), tonen aan dat wanneer leerkrachten gebruik maken van controlerende strategieën, zoals geobserveerd door externe observatoren, dit ook door leerlingen wordt opgemerkt en als controlerend wordt ervaren. Daarenboven werd aangetoond dat zowel de observaties als de leerling-percepties gerelateerd waren aan minder optimale vormen van motivatie, waarbij leerlingen die blootgesteld werden aan meer controlerende leerkrachtgedragingen, meer vanuit druk functioneerden (d.i. gecontroleerde motivatie, vb. “Ik zette mij in tijdens de voorbije les LO omdat ik mezelf moet bewijzen”). Bovendien was geobserveerde controle indirect, via de percepties van leerlingen, ook gerelateerd aan meer amotivatie (“Ik zag het nut niet in van de afgelopen les LO”). In een tweede cross-sectionele studie (Hoofdstuk 3) werd op drie verschillende manieren evidentie gevonden voor het onderscheid tussen een intern en extern controlerende stijl. Experts beoordeelden een set van items en deelden deze op in intern en extern controlerende items. Zowel op basis van factoranalyses als van cluster-analyses op beoordelingen van de weerhouden items door leerlingen, werd tevens aangetoond dat er een zinvol onderscheid kan gemaakt worden tussen deze beide facetten van een controlerende stijl. Resultaten toonden verder aan dat vrijwel alle verbanden met maladaptieve motivatie werden gedreven door een intern controlerende stijl. Voor een extern controlerende stijl werd niet het verwachte patroon van positieve verbanden met maladaptieve motivatie gevonden, na statistische controle voor de rol van een intern

controlerende stijl. Tot slot werd in een experimentele studie met video-gebaseerde vignetten (Hoofdstuk 4) aangetoond dat een controlerende stijl nefast is voor alle leerlingen, onafhankelijk van hun algemene motivatie voor de les LO. Resultaten toonden aan dat leerlingen die filmfragmenten van een controlerende stijl bekeken, aangaven dat ze minder inzet en meer verzet zouden vertonen tijdens een dergelijke les, in vergelijking met leerlingen die naar filmfragmenten van een autonomie-ondersteunende stijl keken. Deze verschillen waren grotendeels onafhankelijk van de mate waarin leerlingen gemotiveerd waren voor het vak LO in het algemeen. Het bleek dus niet zo te zijn dat leerlingen die in sterke mate gecontroleerd gemotiveerd zijn, of die meer amotivatie vertonen, meer positief zouden reageren op filmfragmenten van een controlerende stijl, een overtuiging die bij leerkrachten wel aanwezig bleek. Leerkrachten zijn gemiddeld genomen inderdaad van mening dat druk nodig is bij leerlingen met suboptimale motivatie.

Doorheen dit proefschrift bleek dat een controlerende stijl een unieke ondermijnende rol speelt in de betrokkenheid en motivatie van leerlingen voor LO. Er werd verder aangetoond dat er een conceptueel onderscheid kan gemaakt worden tussen intern controlerende strategieën (vb. induceren van schuld- en schaamte gevoelens) en extern controlerende strategieën (vb. straffen), waarbij de eerste soort strategieën een sterkere voorspeller is van minder optimale vormen van motivatie. Een belangrijk punt dat we willen maken met dit proefschrift is dat een controlerende stijl een eigen dynamiek heeft die voldoende aandacht verdient naast een meer behoefteondersteunende stijl die optimale uitkomsten voorspelt. Voor de praktijk is het dan ook niet enkel belangrijk om leerkrachten te trainen in manieren om motivatie te bevorderen (bijvoorbeeld aan de hand van autonomieondersteuning) maar ook om hen attent te maken op de valkuilen en manifestaties van een controlerende stijl.